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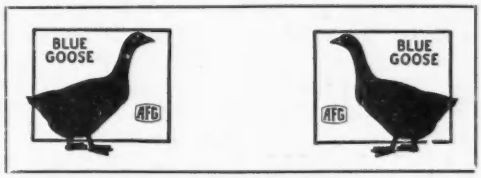
The Citrus Industry

THE ONLY PUBLICATION IN THE WORLD
DEVOTED EXCLUSIVELY TO CITRUS FRUITS

Issued Monthly

Representative of every interest~
Representing no special interest

Vol. 2 No. 10 TAMPA, FLA., OCTOBER, 1921 15 Cents a Copy



SALES SPECIALISTS

The American Fruit Growers Inc., is highly specialized in sale of fruits. Its net-work of branch houses and sales offices covers the country, and is in direct and daily touch with the full buying power of the trade.

The American Fruit Growers Inc., reaches all carlot buyers. It does full justice to the commodities of clients by offering them to the greatest possible percentage of the buying trade.

ITS STANDARDS ARE

Well-graded, well-packed and impartially inspected products.
Careful and direct transportation to the point of consumption.
Intelligent advertising of clients' products.
Securing prompt acceptance of the goods on the part of the buyer.
Making prompt collections for and accurate accounting to the shipper.

YOU NEED SUCH A SERVICE

American Fruit Growers Inc.,

Orlando, Florida

Growers! Growers! Growers!

WE ARE NOW IN POSITION TO HANDLE OR PURCHASE YOUR CROP, OR IF YOU HAVE ALREADY MADE YOUR OWN ARRANGEMENTS FOR THE MARKETING OF YOUR CROP WE WILL ALSO MAINTAIN PACKING SERVICES IN THE FOLLOWING PLACES:

FROSTPROOF, FLA., Representative, M. E. Stewart.
BOWLING GREEN, FLA., " S. A. Carlton.
WINTER HAVEN, FLA., " L. M. Godwin.

Gentile Bros. Company

Orlando, Florida

P. S. Negotiations are now under way for additional packing houses.

CHAS. J. BRAND,

Formerly Chief of the U. S. Bureau of Markets and adviser to the Food Administration during the World War; now Vice-President and General Manager American Fruit Growers Inc. Mr. Brand was the principal speaker at the Citrus Seminar in Gainesville, October 4, 1921.

Why not join the Florida Citrus Exchange?

Other means of marketing fruit having failed to yield uniformly satisfactory returns—

Why not join the Florida Citrus Exchange?

Experience having shown that speculators lack in regard for the growers' interests—

Why not join the Florida Citrus Exchange?

Since the growers are entitled to know where their fruit sells, when, to whom and for how much money—

Why not join the Florida Citrus Exchange?

Because the only way to make an institution better is to get on the inside and assist in running it—

Why not join the Florida Citrus Exchange?

Inasmuch as co-operative marketing is based on the principle that the growers together have the ability to handle the selling of their products—

Why not join the Florida Citrus Exchange?

Since the need for the growers' own organization is greater today than ever before and since its efficiency may be increased by every additional member—

Why not join the Florida Citrus Exchange?

Will you not agree that the Florida Citrus Exchange has accomplished much and that to join NOW would give the organization the benefit of your experience and judgment? For information as to membership consult the manager of the nearest association or sub-exchange, or write to the business manager at Tampa.

ORANGES Sealdsweet GRAPEFRUIT

FLORIDA CITRUS EXCHANGE

ORANGES Sealdsweet GRAPEFRUIT

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Marketing Southern Fruits

By Chas J. Brand.

At the annual Citrus Seminar at Gainesville, conducted by the University of Florida, the chief address of the meeting, given Tuesday evening at eight o'clock at the Presbyterian church, was delivered by Charles J. Brand, Vice President and General Manager of American Fruit Growers Incorporated, formerly Chief of the U. S. Bureau of Markets at Washington. Mr. Brand's address extended over an hour, and was heard by an audience of over two hundred and fifty people. Mr. Brand said in part: "Industrial and business conditions in the United States, while far from their war time peak, are nevertheless better than many times during the pre-war period to which so many persons hark back. The subject of the address assigned to me, 'Marketing Southern Fruits' appeared to me as being rather narrower than is desirable under existing conditions. I trust, therefore, you will agree with the desirability of my broadening the topic somewhat, which I propose to do in order to discuss the following subjects:

1. The General Business Situation.
2. The Prospective Citrus Crop of the United States.
3. Transportation problems.
4. The Standardization of Fruits and Vegetables.
5. Advertising.
6. Volume and Distribution.
7. Taxation, particularly the propaganda for a general sales tax.
8. Foreign Trade.

General Business Situation

Americans generally have short memories. They feel that we are now enjoying "The hardest times that we have ever had." This of course is far from true. Even within recent years it is not difficult to recall the depression of 1900, followed by two years of recovery: The commercial and financial crash of 1903 to 1904, followed by the great prosperity of 1905-1906; the panic of 1907 and 1908 which the "malfactors" of great wealth are accused of having brought upon the United States, followed by the more prosperous years of 1909-1910, and finally the prosperity of 1912; with the acute depression closing Exchanges and general prostration of 1913 and 1914 preceding and accompanying the outbreak of the World War. We have been on a wave of speculation of high inflation, waste, extravagance, over expansion and uneconomic production, so that we feel as if we had fallen from the top of the Washington monument to the ground instead of merely from the twentieth story of a high building to the tenth. While agriculture has been very profoundly deflated, many other industries have not yet come even to anything that approaches normal. In a recent statement showing fifty different commodities, in which there had been a recession to practically pre-war levels, I noted that thirty-one were farm crop or farm crop derivities. In any period of sharp price movements, particularly downward, farm and wholesale prices move first and farthest; retail prices move more slowly; wage change even less rapidly; and manufactured articles, having a high labor content, change more slowly than any of the foregoing; while salaries and rents change slowest of all. Farm and wholesale prices have receded to a considerable extent except in certain lines, but retail prices have not reacted satisfactorily and are at a serious disparity. This is especially true as to farm and food products.

Wages in other industries than agriculture are still exceedingly abnormal. While farm wages average now in the neighborhood of 20 cents an hour, common labor on the railroads is still in many cases as high as sixty-one cents an hour. The wage scale of the United States has been increasing constantly for more than a hundred years. In 1820 the average weekly wage of an artisan was about $7.00; by 1860 it was $10.00 a week; during the Civil War it rose to a level of about $15.00, where it remained relatively stationary until 1900. By 1915 it had risen to over $21.00; while in 1920 it was $42.00. Needless to say, with this fixed rise in costs deflation along many lines has proceeded necessarily slowly. Conditions are improving. In Pittsburg many additional furnaces are being blown in. We hear the same news from Chicago, Cleveland, and other points. There is a firmer undertone not only in businesses in general, but in the security and commodity markets. While unemployment is abroad in the land, improved conditions with constructive efforts at relief promise better conditions. This is of great importance to

the farmers and fruit growers of the United States, as purchasing power of the public will be the determining factor in their operations during the next year.

Prospective Citrus Crop of the U. S.

My investigations indicate the possibility of a crop of 22,000,00 boxes of citrus fruit from California during the coming season. I understand that competent observers in Florida are estimating from 13,500,000 to 14,-500,000 boxes in this state. This is by all odds the largest crop the United States has ever had in prospect. It will require the greatest skill and and the highest order of salesmanship to put this large quantity of fruit into consumption. There are some saving features to the situation, particularly the fact that the apple crop of the northeastern barrel states was so seriously reduced by spring frosts, that whereas we had in 1920 35,000,000 barrels, the prospect of the current year is for only about 17,000,000 barrels. While the crop of the box apple states of the Pacific Coast is a good crop, it will not be notably greater than last year and will not supply the deficiency in winter fruit. Therefore, if skillful salesmanship is exercised and fruit of mature quality, good appearance and high grade and pack is delivered to the markets I believe that the citrus growers will have a profitable year. However, good results cannot be obtained from rushing green, acid fruit to the early market. You can fool all of the public some of the time, and some of the public all of the time, but can't fool all of the public all of the time. The only wise course to pursue is to hold the fruit until it is truly ready to ship.

I wish to urge upon you also the wisdom of giving your distributing agencies, whether they are the Exchange, our own organization, or any other distributor, a volume so that real distribution to the carlot markets can be obtained.

Transportation Problems

The great problem of the day, to my mind, in the whole perishable fruit and vegetable industry is freight rates. The farmers of the United States, whether of grain, live stock, fruits or vegetables, will not go on long working for the railroads to the extent they now are. It is no uncommon thing for the total proceeds of the sale of a car to be consumed, or more than consumed, by the freight charges alone. Not long since, on a single day we had two cars of 400 hampers each of cabbage from one of our properties at Sanford, Florida, sold in the Pittsburgh market for $440.85. Of this amount per car $417.50 was paid out for freight and refrigeration, $22.50 was charged for selling services, leaving us a net of 85c per carload of 400 hampers. The transportation expense on northwestern boxed apples to eastern markets range around $600. to almost $750. per car. Many growers do not receive that much in total proceeds for a car of apples. I understand that the present rates for citrus fruits from Orlando to New York, Pittsburgh and Chicago are $1.12, $1.44 and $1.46 per box respectively. This represents a crushing overhead that must be lightened. I say this with due deference to the difficulties of the carriers, realizing that the rate of 5 1-2 to 6 per cent which the Transportation Act expresses as a fair rate to the carrier on his investment, is not being earned under existing conditions. Persistence in the present high rates will stifle many agricultural industries where they are now located, and they are located as they are because of the climatic, soil and other advantages, and will force production of the more staple crops nearer the consuming centers, with a relative reduction in the importance of fruits and vegetables in our year round dietary.

Standardization of Fruits and Vegetables

Standardization is an absolute essential of successful distribution of products grown on a large scale. The two great purposes served of course are the obtaining of an accurate basis for price quotations and the furnishing of adequate means for the dissemination of reliable and definite market information. Within a few months after Mr. Ford began to manufacture automobiles his plant had developed seventy different types of bodies to suit the varying tastes of the incipient automobile trade. It was as hard to satisfy an automobile buyer as it was a lady buying a new hat. Shortly Mr. Ford himself arrived at the conclusion that a definite plan of production must be laid out, attempting to furnish on a large scale a single model. He selected a model and type intended to reach the largest possible proportion of the population able to afford an automobile. Needless to say, had Mr. Ford continued to manufacture seventy different models there would not today have been distributed to the public in the neighborhood of five-and-a-half-million cars. I say, therefore, that standardization is an absolute essential to large scale business operation. This is true of accounting and business practices, as it is of products and containers. While I was Chief of the Bureau of Markets we repeatedly demonstrated the savings and profits that came from high grade production properly classified and properly packed. Indeed, standardization of agricultural products must begin with production itself, and involves:

1st. The growing of standard market varieties, and elimination of many of the minor kinds now produced.

2nd. The standardization of the methods of production.

3rd. Uniform methods of preparation for market.

4th. The application of standards for determination of quality and of size.

5th. The use of standard packages and containers.

When the United States potato grades, which were prepared by the Bureau of Markets but made compulsory by the Food Administration during the war, were put into force the whole delegation of Congressmen from the State of Michigan demanded the immediate rescinding of the potato grades, with the very positive assurance that they were ruining the potato growers of Michigan. In less than two years from that time the President of one of the largest potato grader manufacturing companies told me that in the year then just closed he had sold more potato graders in Mhicigan alone than a few years before his company had sold in the whole United States. Evidently grading paid, or they would not have bought the graders. It is almost axiomatic to say that a high quality, well graded, well packed, and well handled product is more than half sold, and that in times of market stress imperfect qualities will not even pay the freight, while high qualities will even bring a profit. Some years ago the Bureau of Markets investigated bulk shipments of apples coming into the Chicago markets. If I recall correctly, there were about 350 cars received that year. The accountings examined showed that 160 of those cars of bulk apples did not pay freight charges. I urge, therefore, particularly in view of the prospective large crop of citrus fruit, the most urgent attention to the standardization of grading and high quality packing.

Advertising

Advertising is the one greatest sales force available to distributing agencies. It is advantageous alike to producer and consumer. It has now been applied by one agency or another with great success to oranges,

lemon, grapefruit, apples, peaches, raisins, walnuts, almonds, cheese, cranberries, and other agricultural products. It is no longer to be considered in the slightest sense in an experimental stage. Indeed, I feel about it as I do about any further argument as to the advantages of co-operation. They are so obvious and so manifold that it is idle to further argue about them. They are to be taken for granted in our planning as much as we take for granted that "honesty is the best policy" or that "the law of gravity is in constant operation." Advertising means education of the consuming public, the creation of food habits and the calling into force of appetite appeals that will lead to the consumption of the advertised products. It ignores to a great extent individual business getting, and operates for the benefit of the industry as a whole, and of the consumer. The advertising of California oranges helps the Florida grower, and vice versa. In 1893 California had a citrus crop of approximately 2,000,000 boxes; in 1906 the crop had reached 10,000,000 boxes. Good organization enabled the industry to distribute and secure the absorption of the five-fold increase from 1893 to 1906. By 1920 the crop exceeded 20,000,000 boxes. Advertising was the force, plus good organization previously largely attained, that made possible the putting into consumption of the 100 per cent increase attained by 1920. The raisin growers of California in 1913 produced 140,000,000 pounds of raisins, but only 110,000,000 pounds were consumed, leaving a carry-over of 30,000,000 pounds. By 1917 the crop had risen to 320,000,000 pounds produced, with 326,000,000 consumed. Advertising was the force that increased the sales, in a period of less than five years, by 216,000,000 pounds. The average per capita consumption increase was from 1 1-10 pounds to 3 26-100 pounds. I have adopted 1917 for the comparison rather than a later date because I realize that some of the opponents of the Volstead Act will rise quickly in their places to attribute the increased consumption not to advertising and better distribution, but to prohibition. The same holds true of many of the other products mentioned. Advertising is the cheapest sales force that can be exerted. In the face of the enormous increase in crops, with the consequent greater selling difficulties, costs of marketing have in every case of advertised products diminished. I urge, therefore, that you ally yourselves with agencies of distribution that can give you the benefits of advertising with respect to your crops.

Volume and Distribution

Marketing Agencies, whether of your own development or employed by you, can render you the greatest service only when they have control of a large volume of products. It is not wise nor best for the producer or the consumer that there should be monopoly or complete concentration of distribution of any one crop in the hands of any single instrumentality. Several agencies should always be available in order that the corrective power of competition may come into play and enforce efficiency upon all. Nevertheless, I feel that under existing circumstances the quantities to be distributed of many products are so split up as to render inefficient to a considerable extent the efforts of all marketing agencies in the particular field. The benefits of advertising can be harveted in full measure only when volume sufficiently large is concentrated in such a number of hands as make it possible for them to make advertising appropriations and to put into effective force broad-gauge, nation-wide policies.

Taxation

The question of taxation assumes considerable importance at the present time when the proponents of a general sales tax are so actively promoting the adoption by Congress of a sales tax. There are numerous kinds of sales tax. First, the general "turnover" tax, so called, which would apply a tax to every turn over, both of goods and of services. Second, the limited turn over tax, which would apply a tax only to merchandise and goods of all kinds. Finally, the retail sales tax, which falls only on the sale by the retailer to the consumer. There are other variations, but these represent the extremes. The proposal generally is that there should be a 1 per cent tax upon the gross sales of all merchandising and similar enterprises. The American Fruit Growers, Inc. in 1920 handled in excess of $38,000,000 worth of perishable products. A 1 per cent tax, amounting to $380,000, would far more than have wiped out every penny of earnings received as compensation for handling this huge aggregate total of products. Any tax laid upon gross sales is to my mind vicious. Taxes should be assessed as much as anything upon the ability of the person taxed to pay. That ability depends upon net and not gross profits. Many inequities will arise if a sales tax is adopted. For instance, the great integrated industries like the packers, the steel corporations, the oil companies, and others, may readily be called upon to pay only a single tax, while independent industries purchasing raw materials will be compelled to pay a tax at each stage of manufacture where products change hands. There would be a tax, for instance, on the sale of the ore in the case of a steel product, upon the pig iron, upon the billets, upon the sheet of steel, and finally upon the finished product, both when sold to the wholesaler and when sold by him to the retailer, and by the retailer to the consumer. The whole question of the sales tax is greatly complicated, but it seems clear that for the agricultural industry, viewed in its widest aspects and including those responsible for the distribution of the products of the farm, it will work very injuriously. The Committee on Ways and Means some time ago announced its determination not to consider a sales tax. However, within the last two months those in favor of it have redoubled their energies, so that we should not rest with any sense of security that its enactment will not be attempted at any session of Congress.

Foreign Trade

There is a constant agitation for a greater foreign outlet for our products of farms and factories. There are many who believe that without foreign trade we will languish, if not die. I wish to point out the fact that since 1890 the United States has gained over 42,000,000 in population, a number greater than the whole population of the French Republic. Since 1900 we have gained over 25,000,000 in population—a population greater than the Republic of Brazil, the most populous of the South American countries to which we look eagerly for commerc'al relief through foreign trade. Our gain in population from 1900 to 1920 exceeded the total population of what once was the great Austro-Hungarian Empire. It seems to me, therefore, that excepting cotton because of the world distribution of spindles and certain of the grains, we should not look too largely for relief to foreign trade, but should cultivate and develop our domestic markets. When the raisin growers, by suitable advertising publicity, increased raisin cosumption over two pounds per capita in a year, it raises the question as to whether we cannot accomplish more by intensifying in our domestic markets that are under our noses rather than by launching further in a world of foreign trade,

(Continued on Page 28)

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THE CITRUS SEMINAR—PROGRAM

GAUGED by the program presented, the Citrus Seminar held at Gainesville on October 4 and 5 was a great success. Both in the wide range of topics covered and the excellence of the papers presented, the program was full of interest and valuable information. The discussions which followed each paper were "meaty" and evidenced the great interest taken by the growers present.

Problems of the grove, the packing house, distribution and sale were ably handled by able men, and it is not too much to say that every grower and shipper present acquired new views and new ideas which will be put to practical use in the varied branches of the industry.

The faculty of the agricultural department of the state university were tireless in their activities in preparing and carrying out the program and every facility of the university was placed at the disposal of the visitors. Dr. Wilmon Newell and his associates earned to the utmost degree the hearty appreciation and approval which was voiced on every hand. It is doubtful if any session of the Citrus Seminar which has preceded that of 1921 has been of greater value to the growers of Florida than the one just held.

In addition to the excellent papers which are reproduced in this issue, many others of equal merit were presented, some of which The Citrus Industry hopes to present to its readers in later issues. Among the most timely and interesting of these were the talks on "Citrus Work in Florida by the Bureau of Plant Industry" by Dr. W. A. Taylor, chief of the bureau, and "Importance of Quality Fruit and First-Class Pack" by M. J. Daetwyler of Orlando.

That the Seminar was a success from the standpoint of the program rendered was the unanimous verdict of the fruitmen present.

THE CITRUS SEMINAR—ATTENDANCE

GAUGED by the attendance, the Citrus Seminar was disappointing. There can be no question about that. This sentiment was voiced both by those who attended the Seminar for the first time and by those who had been regular attendants at all of the previous meetings.

The program was one which should have commanded the interest of all citrus growers, whether of the pioneer class or of the recent acquisitions to the industry. As a matter of fact, the program DID command such interest, but this interest was overshadowed in all too many cases by the inaccessibility of the location and its distance from the citrus centers. Until Gainesville is connected up with the centers of citrus production by good roads—or until the Seminar is located at some more accessible point, this disappointment in the matter of attendance is certain to prevail.

Probably 90 per cent of the growers who attended the Seminar made the trip by auto. To many of them, this meant a trip of from 150 to 250 miles each way, much of it over roads which to the citrus grower of South Florida constitute a nightmare. Many of them made the trip for the first time—and some declared that they had made it for the last time—until better roads are provided.

In some respects it must be conceded that the university is the natural and logical place for holding these gatherings. Here the members of the faculty are at home amid their appliances and available to their laboratories for any demonstrations which may be required. Here, too, the grower is permitted to become acquainted with the work which the university is doing to aid the industry.

But, to offset these advantages, is the great distance from the centers of citrus production, the inaccessibility of Gainesville, the poor roads and the time required in making the trip. With the Seminar located at some central point in the citrus belt these disadvantages would be overcome, while the possibility of carrying on grove demonstrations in the citrus groves would go far to offset the lack of laboratory demonstrations.

Much discussion along these lines was heard among the growers present, and the sentiment was freely expressed that if the Seminar is to serve the purpose for which it is intended and to reach any large portion of the citrus growers, steps must be taken to bring Gainesville into closer touch with the citrus centers, or to remove the Seminar to a more central location.

THE CROP OUTLOOK

THE Citrus Industry takes no stock in the exaggerated estimates of the citrus crop of Florida this season. Talk of a seventeen-million or even of a fifteen-million box crop, we believe, are entirely unwarranted. If the official government estimate of 13,600,000 boxes is realized, we shall be greatly surprised. In the light of first hand knowledge and the estimates of the most conservative growers and packers, we doubt if more than 12,500,000 boxes of citrus fruit will be shipped out of the state this season.

In many sections of the state the crop has suffered irretrievable damage as the result of drouth. Already there has been a heavy drop and the loss from this source is certain to increase from this time on. Then, too, the crop is running for the most part to small sizes, which will tend to reduce the number of boxes. There are exceptions to this rule, it is true—some scattered localities in which the fruit is of larger size than a year ago—but as a general proposition, the rule holds good.

The increase over last year's crop, if there is to be increase, must come from the large acreage of grapefruit just coming into bearing, and it is very doubtful if this increase will more than offset the smaller crop and smaller fruit on the older trees.

As the situation appears today, the crop of this season will be little if any larger than that of a year ago, while for the state as a whole, the fruit will be smaller. This should mean that the grower of fancy fruit will have a tremendous advantage in the markets, as the demand for such fruit is always heavy and this year the competition on this grade will be reduced to the minimum.

Marketing problems divided interest with grove problems in the discussions at the Citrus Seminar. The grower is learning that his problem is only half solved when he has produced an abundant crop of fruit of good quality.

FEDERAL FUNDS FOR GROWERS

AS A result of the movement inaugurated by the Florida Citrus Exchange, and largely as the result of the efforts of the officers of that body, Florida citrus growers will soon have available for the financing of the present crop one million dollars or more of federal funds, through the medium of the War Finance Corporation.

This action came as the result of a visit of President Ross, Business Manager Stewart, Manager Miller of the Exchange Supply Co., C. H. Walker, manager of the Growers Loan and Guaranty Company, and Dr. L. A. Bize, president of the State Bankers Association, to officials at Washington.

The outcome of the conference was the agreement to place at least a half million dollars at the disposal of the Florida Citrus Exchange for the financing of its members, and an equal amount at the disposal of growers outside the Exchange in case such growers care to avail themselves of the offer. There is little doubt that the full amount of one million dollars will be used by the citrus growers of the state during the season, while there is a probability that this sum may be increased should the demands of the industry seem to require it while funds are yet available.

It is believed that the funds to be provided by the War Finance Corporation may be available within the next thirty days, and certainly by the early part of December, according to the assurances given the representatives of the Florida growers.

This action of the War Finance Corporation will tend to greatly relieve the local financial situation and to make available for other uses the vast sums of money which have been advanced by South Florida banks to finance the growers and growers' organizations in the erection of packing plants and other facilities for caring for the present crop. The officers of the Exchange are entitled to credit for taking the leadership in this matter which means so much to the industry.

ORANGES FROM ARGENTINA

THE first shipment of citrus fruit to this country from Argentina was received in New York September 26, the day on which the first shipments of Florida grapefruit left the Dade county groves.

The shipment was composed of 1,000 boxes of Argentine oranges and was brought in by the steamer Huron from Buenos Aires. The fruit was placed on sale in the auction markets and sold at $2 per box.

At this figure., after paying transportation, dockage, handling and brokerage charges, it will be seen that a very small margin is left for the grower of the fruit. In spite of the low price at which the fruit was sold, however, it is announced that other shipments of the Argentine fruit will follow.

While not assigned a place on the program, compulsory spraying was one of the topics of popular discussion, unofficially, at the recent Citrus Seminar at Gainesville. There is a growing belief that steps should be taken to compel grove owners to protect not only their own but their neighbors' groves by proper care.

That there will be a smaller acreage of grove plantings this season than last, but that the new plantings will be more intelligently done and by men more familiar with citrus culture, is the opinion expressed by one of the leading nurserymen of the state.

A late summer visitation of whitefly is reported from some groves where spring spraying was neglected.

NOT A SQUARE DEAL

H. C. McKenzie, director of taxation service of the American Farm Bureau Federation, has addressed the following letter to each member of the Finance Committee of the U. S. Senate:

"Neither the tax bill passed by the House, nor the Smoot substitute gives the mass of the people a square deal; both are drawn to relieve the most prosperous and shift the burden onto the less prosperous. The House Bill relieves the corporations with high earnings of the bulk of their taxes and increases the tax on the little fellow. Under the bill the man who now has two-thirds of his money in tax-free securities is going to have his taxes cut in two on the other third. The individual who would still have considerable taxes to pay, owing to the fact that he had not invested in tax-free securities, is going to be taken care of. All he will have to do will be to incorporate and then his maximum taxes will be 12 1-2 per cent.

"The law will not produce enough money to run the government. Instead of reducing the national debt, it will be increased, and the grand-children of the present generation will be paying interest on the debt to the people of wealth who are now being relieved of their taxes on that part of their money which they do not have already invested in tax-free securities. More revenue will have to be provided and the easy way to get it will be to exact more consumption taxes; thus the burden will have been shifted from the incomes of those who are able to pay to the necessities of those who are not able to pay, and the poor will be paying taxes to the rich who are dodging taxes by means of tax-free securities and unjust legislation.

"What a commentary on justice and free government! What will be the effect on the minds of the people generally?

"The mass of the people are a unit against the repeal of the Excess Profits Tax and to the reduction of the surtaxes until tax-free securities are abolished."

Every citrus grower in Florida should have heard the opening address of Dr. C. K. McQuarrie, state agent, at the Citrus Seminar in Gainesville. Dr. McQuarrie's talk was full of deep thought and proved an inspiration to the growers who heard it. The keynote of his talk was the protection of the citrus trees from disease and pests through proper preparation and care. As the human being in fit condition will throw off disease where a weaker one will succumb, so a well nourished citrus tree will resist the attacks of disease which prove fatal to the improperly nourished tree, declared Dr. McQuarrie. In which statement, every thoughtful grower must agree.

The invasion of pickers and packers from the North has not only set in, but is on in full blast, according to grove owners and packers throughout the citrus belt. The supply of labor in these lines promises to be more abundant than at any time in recent years.

There is money in the citrus industry only for the grower who produces his crop intelligently and markets it wisely.

Three essentials to successful citrus culture—fertilization, cultivation and spraying. The neglect of any one of the three will reduce your yield and profits.

Two poor investments—a spraying machine under the shed when it should be in the grove; and the same machine in the grove when it should be under the shed.

Florida Citrus Exchange Reports Good Year

The annual report for the fiscal year ending Aug. 31, as submitted by Business Manager C. E. Stewart, jr., to the board of directors of the Florida Citrus Exchange showed the year to have been the biggest in the history of the organization, in point of number of boxes of fruit handled, number of local associations affiliating, number of individual members and the number of northern markets in which fruit was sold.

The exchange handled 32 1-3 per cent of the crop of the state; and figures showed the organization to be growing considerably faster than the increase of the state's citrus crop.

In its effort constantly to widen the distribution of its fruit, sixty-four new northern markets were opened and carload sales effected. Eleven new exchange packing housese are now under construction in various south Florida localities and the volume of fruit which the exchange will handle during the coming season, exclusive of the additional tonnage of the Standard Growers' Exchange, is estimated at a very large increase over the last season. When to this is added the large holdings which the co-operative organization will sell for the account of the Standard, it is anticipated the exchange total for next season will be imposing.

It was estimated that increased freight charges last season cost the exchange growers alone some $2,400,000 above the normal transportation costs. The cost to the exchange, of fighting for reduced freight rates, together with the successful resistance it lead against the proposed diversion restrictions and for retention of the bulge pack, was considerable. However, the traffic department of the exchange during the year collected in excess of $180,000 in claims against carriers. The reduction of thirty-six cents per box on grapefruit, recently secured from northwestern lines to Montana, Oregon and Washington points, it is hoped, is only the beginning of a readjustment of freights to lower levels, for which the entire exchange organization has been bending every effort.

Can Pre-cool 500,000 Boxes

Four pre-cooling plants now in operation it is estimated will next season permit the handling of a total of 500,000 boxes of precooled fruit, with a saving of forty-five dollars per car in refrigeration cost, while reducing decay in transit very materially. Precooling is being studied carefully by the exchange. Much scientific data is being accumulated, which shortly will be made available to all local associations in pamphlet form.

Exchange advertising the last year was reported as the most ambitious effort in its history, the larger volume of shipments and consequent larger funds, making it possible. The results were gratifying, and met with the hearty approval of northern sales representatives. As previously the bulk of the money was spent in northern newspapers, some magazine space and color pages being used. It was pointed out that the exchange's advertising problem is quite different from that of its sister organization on the Pacific coast, and therefore must be handled differently. The latter is able to dispose of its product to some extent in every state except Florida, while the limitations upon the Florida organization confine it to a much smaller territory. Therefore, it has been found best to do the bulk of the exchange advertising in places and at times when its fruit is available for consumption.

Sixty thousand northern housewives wrote to the Tampa offices last year for a copy of the recipe book, which the exchange mentions in its advertising, and which tells how to use oranges and grapefruit and why buyers should ask for the Sealdsweet kind.

The work of the specialty crews, introducting grapefruit and of Mrs. Caroline Moorhead special demonstrator visiting schools, college and women's clubs, was reported as the most effective since this effort has been inaugurated. In Milwaukee more than 12,000 persons registered at the Sealdsweet booth maintained at the food show there, by members of the specialty organization. Mrs. Moorhead visited and demonstrated before the student bodies of more than a hundred northern shools and colleges, in addition to other work before women's clubs and other organizations.

The exchange has accumulated much data on the subject of possible shipments of fruit by water, and conferences have been held in New York and elsewhere with the managements of the leading steamship lines and owners of refrigerated ships. The report expressed the opinion there would be small difficulty in obtaining boats or proper wharfage facilities at northern terminals but Mr. Stewart said that as yet he and Traffic Manager E D. Dow had no recommendations to lay before the board, as no one definite and feasible plan yet had been worked out, the big difficulty being in obtaining guaranteed cargoes from Florida ports. Such guarantees, in his opinion, must be forthcoming to make any such project a success, as the cost of demurrage upon a boat waiting for cargo, whether chartered or owned by the growers, would offset all the advantages it might otherwise be hoped to gain through the use of ships.

TO SUPPLY PROGENY BUD WOOD COMERCIALLY

Director Wilmon Newell, of the Florida Experiment Station, acting under authority of the Board of Control, has recently signed a cooperative agreement with the Bureau of Plant Industry, United States Department of Agriculture, whereby citrus bud wood from trees of proven worth is to be produced at the Branch Experiment Station, Lake Alfred, for Florida growers.

This agreement covers investigations that will extend over a period of years and will involve the production of bud wood on a commercial scale from performance record trees of the standard citrus varieties in Florida. It will also involve the growing of propagating material of new and promising citrus varieties. New root stocks will be introduced at the station, together with as complete a collection as possible of the wild relatives of citrus fruits for testing as stocks and for utilization in hybridizing experiments.

The work contemplated is perhaps the most comprehensive line of research yet instituted in connection with the Florida Experiment Station's being in position, within a few years, to supply growers and nurserymen with bud wood from trees of proven worth. The bud-selection and progeny work included in this program will probably do more than any other thing to increase the productivity of Florida's citrus groves, as well as to standardize the citrus fruits produced in the state.

Some Fundamentals of Grove Pest Control.

By W. W. Yothers, Orlando, U. S Bureau of Entomology, at Citrus Seminar.

Grove pest control is not a superficial subject. On the contrary, it is an intricate and highly technical one. It makes use of the principles of mechanics in the application of sprays; it draws upon chemistry to its utmost limit to originate new insecticides and still requires further investigations to supply its needs; it utilizes the known facts of biology and demands further researches into both insect and plant life.

Fundamental knowledge pertaining to grove pests and methods for their control may be difficult to acquire, but it is of the very greatest value. Such essential information should clarify some of the apparently intricate factors relating to proper grove pest control, and render more easily understood the reason underlying practices and recommendations pertaining to the control of insect and mite enemies of citrus trees.

The application of fundamental principles to pest control should enable citrus fruits to be grown more economically than at the present time. Insect pests and mite enemies would be kept in just the state of subjection as would be profitable. More vigorous trees would respond with increased yields. Much waste would be eliminated in spraying. At the present time due from many causes it is conservatively estimated that at least 50 per cent of the spraying yields no profit whatever to the growers.

In the first place, the grower should have well defined ideas as to what actually constitutes proper pest control. Unless the end to be sought in pest control is known, it is simply useless for the grower to proceed to accomplish an end which he would not know even if it were realized. Some growers wait until the pests have done an enormous amount of damage to their trees before remedial measures are applied. In doing so, a large amount of the good that would have been accomplished by artificial measures were never realized. Then again, we have known most excellent grove owners to spray their trees when there were not enough pests present to cause any damage whatsoever. In both instances the grower did not have the proper conception of what constituted commercial or practical control. Fundamentally, grove pests should be kept in such a state of subjection that the means employed to attain the end are profitable. It is certainly useless to fight a pest if the cost of the operation is greater than the damage resulting from the presence of the pest. It is an economic waste to do so and increases the cost of producing fruit.

Grove pest control may be considered under three fairly well defined methods: (1) The reduction of pests to a minimum and maintaining them in such a state indefinitely. (2) The total and complete dependence upon natural control. (3) The dependence upon natural control supplemented by artificial means when the pests are present in such numbers which if left without treatment the resulting damage would be greater than the cost of placing them under control.

In so far as is shown, the first of these which we may term the pest free method has probably never been thoroughly tried out and is not practised to any great extent in this state. It may be that the most economical and feasible way to control pests in a grove is to wage a vigorous campaign upon them to reduce them to practically negligible numbers and then keep them in such a state of subjection. Perhaps this is the proper method because all of us realize that it is a rather easy matter to keep most species of insects down if they are once reduced to negligible numbers. It may be that all of our recommendations are dead wrong and that some day in the future this will be the accepted method among the citrus growers. It is reasonably certain, in my opinion, that this method will have to be followed if the growers expect to practise bud selection. If either of the other two methods are followed, there is no certainty that the variation in yields or in the quality of the fruit may not be produced by the devitalizing effects of the insect enemies and mites which varies from tree to tree. The insect problem will have to be eliminated even if bud selection experiments are undertaken. Otherwise the data will be of no value. In order to practise the pest free method economically the grower would necessarily have to be quite familiar with the life and seasonal history of several of the more important pests. He would have to recognize their eggs; young and adults. Much knowledge of insecticides would also be necessary to keep costs down to a minimum. In fact I rather think it would require a graduate of the University of Florida combined with one or more years in practical grove pest control work. At the present time we are following this method in the experimental grove at Orlando. It is worthy of trial also by some of the growers.

In regard to the second method, it must be admitted that this is the most extensively followed one in this state. Until very recently practically all the citrus growers relied completely and implicitly upon natural control. Internal parasites, predacious enemies and above all entomogenous fungi are certainly powerful factors in reducing damage from citrus pests. This method certainly has its advantages at the present time. It involves no expense nor worry and produces fairly satisfactory fruit. In many cases growers are absolutely justified in their reliance upon these parasites and fungi and in other instances, I fear they are not. It may be that when the fundamentals relating to the entomogenous fungi, internal parasites and predacious enemies are discovered and their applications to insect control worked out, this method will be the logical one for the growers of this state.

At the present time, however, it is my opinion that the third method, or a combination of natural control and artificial treatment, may be the most practicable and feasible one to follow. This method has been followed by us in all our recommendations during the past ten years. It is a method that appeals to most citrus growers as being the least expensive and best adapted to citrus growing at the present time.

The presence of entomogenous fungi is the most important factor pertaining to the control of grove

pests in this state. They are worth millions of dollars to the Citrus Industry. They are of primary importance in considering any artificial means for the control of practically all citrus pests. All artificial means such as spraying is designed and intended to supplement the action of these fungi. Owing to the number of these fungi and their presence on practically every major pest on citrus trees, the grove pest control problem becomes exceedingly intricate and complicated. The ups and downs of pests in this state is largely caused by the relative efficiency of their fungus enemies, and it is difficult to know just when a pest will appear in great abundance or when it will be reduced to a state of commercial control. Consequently, all gradations of abundance and scarcity of pests may be present in a single grove throughout the year. The same condition may exist in different groves in the same community. One section of the state may likewise be overrun with one grove pest, while in another section, it is present in such few numbers as to demand no remedial measures. Much fundamental information, therefore, is required to determine if a pest should receive treatment.

The abundance of the fungi also vary with the season of the year. They multiply mainly during the rainy season from about the middle of June to September. It is very doubtful if any insecticides should be applied to citrus trees during this period. In most cases, the fungi will accomplish as perfect control during this period, as is obtained by the average spraying and of course with no expense.

Practically all the white flies infesting citrus trees are attacked by entomogenous fungi. These, of course, produce all gradations of control or non-control. As mentioned before, they are mainly active during the rainy season, but we have also known the brown fungus to literally overrun the state during the month of December which was a very wet month. It is pretty well settled perhaps in the minds of the growers that spraying for the white fly should be done either before the fungi are able to increase very rapidly or after they have done the main part of their work. If the white flies are reasonably abundant after the first brood in May or early June, it is usually well to resort to spraying. If the white flies are rather scarce, it may be advisable to permit the entomogenous fungi to act during the rainy season. After the rainy season is over and there is quite a large percentage of white flies living, no doubt, it would be profitable to spray for this pest. This should be done some time after the disappearance of the third brood which will be about the middle of September. An attempt should be made to spray before the trees and fruit become very black with sooty mold. On the other hand, if the fungi have produced commercial control, such as indicated by the lack of sooty mold and also the presence of very few living pupae, then it would be advisable not to spray for this pest. As to whether one should or should not spray for white flies depends entirely upon the degree of commercial control brought about by the entomogenous fungi during the rainy season.

The fundamental principles relating to the control of the white flies are applicable, in the main, to the control of the purple scale. There is, however, one important and fundamental difference. The third brood of the citrus white fly deposits eggs in August and early September which hatch and develop into pupae, and remain on the leaves until the adults emerge from them the following March. They do not multiply or reproduce during this time. The purple scale, on the contrary, reproduces during this entire period; the rate of reproduction depending upon the temperature. The greater the temperature the more reproduction. It is, of course, true that the purple scale has more or less broods, but hatching takes place continuously. If the purple scale at the end of the rainy season is in a fairly good state or condition of commercial control, it does not mean, therefore, that it will remain so until the next rainy season or even until the next spring. Of course, we realize that some exceptional weather conditions may cause the fungi to increase, and, on the other hand, exceptional weather conditions may cause the purple scale to increase. This warm temperature in all probability is the explanation for the unusual abundance of purple scale, in the warmer sections of the citrus belt during the spring months. Perhaps the greatest economic loss to certain sections of the citrus belt is caused by the presence of this pest from January until June. It levies a terrific toll upon the vitality of the trees and reduces the bearing surface to an amazing extent.

It would be a most interesting problem for the entomologist to find out or discover predacious enemies or hymenopterous parasites which would control the purple scale from January to June thus supplementing the action of the fungi in these warmer sections of the state.

For many years, I have known that the rust mite reaches the maximum point of infestation usually in June. Numerous growers also have realized this. No explanation has ever been offered by me for this phenomenon and the growers have always claimed that the rains washed the mites away. It is now definitely settled, as shown by Dr. Speare, that a short time after the rainy season sets in a most virulent fungus appears and practically exterminates this pest. This fungus acts almost like an epidemic. When the rust mites are thus reduced, their curve of abundance ascends very gradually and evenly until about the middle of May when it ascends very abruptly until about the middle of June. Then the curve drops almost completely. It is therefore, reasonably certain that spraying intended to reduce the damage of this pest should be done some time before it reaches the period of maximum infestation. It is some question in my mind, if it is profitable to spray for the pest after the rainy season begins.

We have only mentioned three of the major pests infesting citrus trees with reference to their natural enemies. The same guiding principles, however, should apply for the control every injurious species.

The Fundamentals of Artificial Control

In the foregoing part of this paper we have endeavored to present some of the fundamentals relating to grove pest control as part of a system of horticulture or grove practice. Since it will be necessary for a large number of growers to resort to spraying or other artificial means in order to reduce the damage from various grove pests, some of the underlying principles of artificial control may be of value.

Before entering upon any artificial means of control the cost should be figured and compared with the expected profits. The cost should be figured out, perhaps, as so much per box and the profits likewise. In figuring up the profits resulting from any operation consideration should be given to three things: First, profits that may accrue from increased production, if any of a greater number of fruits per tree; second, the increased yield due to the increased size of the fruit, and, third, the increased price resulting from raising the grade of the fruit. When a citrus tree has few or no bearing wood in the center, it is reasonably certain that the condition has been brought

about by the ravages of the purple scale. Spraying will eliminate this condition and in one year the tree will fill out completely with bearing wood. It is of course most difficult to estimate the probable profit that may arise by increasing the bearing wood, but the grower should form some estimate as a basis for figuring probable profits, if any. In estimating the profits from the increase in size and from raising the grade of the fruit, it should be noted that from 60 to 65 per cent of the crop will not be reduced in size nor lowered in grade. The profits therefore, if any, should only be credited to 35 or 40 per cent of the crop while the entire crop must be treated. To illustrate, if it costs 10c a box to produce a 100 per cent crop of bright fruit and the increase in size and raising the grade is worth 30c per box, the spraying costs simply the profits balances. It should also be taken into consideration that one application for bright fruit or perhaps I should say for rust mites will produce 90 to 95 per cent bright fruit, but in order to produce a 100 per cent crop of bright fruit several applications will have to be applied. The question now arises for the grower to consider is, does it pay to spray two or three times for 5 per cent additional bright fruit?

When an application of insecticide is to be made, it should be applied at the time when it will do no injury to the fruit, both as to the effect of the insecticide on the fruit and the effect of the mechanical injuries in applying the same. This is the most fundamental perhaps of all the factors of artifiicial control. The fruit is of primary importance and nothing should be done which will injure it. Some times during the fall of the year, groves have very few white flies or scale insects and have heavy crops of fruit. The trees may be so planted that many of them have interlocking branches and many other branches are very near the ground. They also bend over so that it is extremenly difficult to reach a desirable percentage of the leaves on the under side with the spray. If a spraying machine is taken through such a grove the growers should be careful to estimate the injury to the fruit which may be caused by the application of the insecticide. This mechanical injury may amount to as much as the cost of the spraying itself thus doubling the cost. Under such conditions we have repeatedly advised people not to spray until after the removal of the crop. If on the other hand, the grove is black with sooty mold and infested with large numbers of living white fly pupae and purple scale, it would be advisable to proceed with the spraying regardless of the mechanical injury caused to the present crop, since if the insects were left without treatment, great injury will result and next year's crop will be reduced to a large extent.

It is also well known that if the spring spraying for the first brood of white flies was given at the time when the insects were in the most susceptible stage, the application would have to be made sometime about the middle of April when the fruit is extremely small and sensitive to the oil sprays. Of course, we have known people to spray in the bloom and also at this time without injury, but we have never been courageous enough to recommend spraying at this time. Since the fruit is as mentioned before, of primary consideration, this spraying instead of being done at the time which the biology of the pest would indicate is postponed until the time when the fruit is less sensitive to the action of the oil sprays. These two apparently contradictory ideas cannot be reconciled and the grower must choose between them. In fact some growers are omitting the spring spraying entirely and applying one or more applications some time between the first of October and the last of January.

While it is true that fairly satisfactory results, can be obtained in spraying for white flies and scale insects any time during the year, this perhaps is rather a wasteful practice. All insects go through various stages including the egg, larval, pupal, and adult. Some of these stages are much more resistant to sprays than other stages. The eggs of most species of insects are more difficult to kill by an application of a contact insecticide than are the other stages. This is due to the fact that the eggs have two coverings or perhaps what might be called skins or shells. Even though such is the case, fairly good results can be had in spraying for white flies when the eggs are present in greatest numbers. It is best however to wait a couple of weeks until the eggs have hatched and the insects are, therefore, in a vulnerable condition. On the other hand, spraying should not cease if the adult white flies emerge and begin the deposition of eggs before the spraying has been finished.

In reference to the purple scale, it should be remembered that eggs, crawlers and adult females are usually present throughout the year. There is however, three broods or times when more hatching takes place than at other seasons. These occur in March, the third week in June and September. The usual sprayings for white fly will also come about the proper time to handle this pest to the best advantage. If the scale is abundant a spraying the last week in June will be most effective in killing this pest. If the scale is abunant, it may be necessary to spray twice at an interval of a month or six weeks. It is really not known just how long after the first spraying is given before the second should be applied.

The rust mite is perhaps the most easy pest to control that infests citrus trees. Although such is the case, there are certain fundamental ideas which should guide the grower in spraying for this pest. In the first place, it should be understood that the rust mite is present on the leaves, branches and fruit throughout the entire year, and it reaches its maximum period of abundance in the spring sometime in May or June. We have known this period to come as early as the first of May in 1911, and, after the 1917 freeze, as late as the middle of July. The grower should familiarize himlsef with the appearance of this pest and when it reaches the point where injury is likely to follow, spraying should be resorted to. Perhaps 90 or even 98 cent of the injury, resulting from the presence of rust mites, is done in May and June. On grapefruit it appears somewhat earlier than it does on oranges; and appears earlier in the Southern part of the state than in the central part. The russeting of the fruit, of course, cannot be eliminated by the use of sprays after it has appeared on the fruit.

It is generally known in Florida, that emulsions made of cheap mineral oils are used for spraying to control white flies and scale insects. There are many kinds of these oils and it is not known just which makes the best insecticides. We do not know what physical properties an oil should possess in order to have the greatest insecticidal values. We have thought that an oil to be the most effective in killing insects should possess high viscosity and low volatility. Perhaps different oils should be used for killing different insects and also at different seasons of the year. For a severe case of purple scale, it may be well to use an emulsion made of an oil with a high vicossity while one with a much lower viscosity would be suitable for the

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Experiments in Grapefruit Storage

By Lon A. Hawkins, Plant Physiologist, Office of Horticultural and Pomological Investigations, U. S. Department of Agriculture

(Paper read before the 12th Annual Citrus Seminar at Gainesville, Florida, Oct. 5, 1921.)

The cold storing of citrus fruit has received very little attention in the past. This is due no doubt to the fact that these fruits will remain in good condition on the trees for some time after they are ripe or after they have reached the stage of maturity in which they are edible and palatable. Most of the cold storage work that has been done has been limited to oranges and there is little published data available on the storage of this fruit. The commercial cold storage man will, as a rule, accept citrus fruit for storage for a long period at the owner's risk but in most cases is not anxious to have it at all. This condition is not satisfactory for either the producer or cold storage man and it was in an effort to obtain definite information on possibilities of storage for some of the citrus fruits that work was begun on the storage of grapefruit in 1917.

There were several reasons for taking up the experiment. In the first place, it is generally considered that citrus fruit will not ripen off the tree, that is, it is unlike pears and apples the flavor and eating quality of which are as good or better when ripened after removal from the tree as when the fruits are brought to full ripeness before picking. It was planned in these experiments to see if grapefruit might not behave in much the same way as do pears and apples.

In the second place, in the marketing of any commodity it is always a decided advantage to be able to keep it without deterioration until there is a demand for it and a reasonable price can be obtained. There are frequent gluts of the market, along in January, February and March, when it would be very advantageous to the producer to be able to place his fruit in cold storage until the prices are right. This possibility of glutting the market will be more important as the young grapefruit groves of Florida come into bearing.

A third consideration is the fact that in the seeded varieties of grapefruit the seeds are liable to sprout in the late season while the fruit is still on the trees. This, of course, injures the delicate flavor of the fruit and tends to render it unattractive. If it were possible to pick this fruit and place it in storage before the seeds sprouted and be sure that it would be in good condition some months later, it would be of considerable benefit to both the producer and consumer. Furthermore, if it were possible to store grapefruit at no greater cost than for the storage of apples, the season for this fruit could be extended well into or through the summer. There is always a demand for this fruit at all seasons.

These considerations made it seem well worth while to take up the investigation. The plan of the experiments was: First, to determine the physiological changes which take place in grapefruit under different storage conditions; second, to obtain evidence as to the time in the grapefruit season at which the fruit had reached its highest food value, and also the time in the season that the fruit stored best; third, to work out methods for storing grapefruit at cold or common temperatures and if possible adapt these methods to commercial conditions.

"Common Florida" fruit from Homestead, Florida, was used for the most part in these experiments. It was expressed to Washington and there placed in storage. Six temperatures of storage were employed in these first experiments, 32°, 36°, 40°, common or warehouse storage about 55°, 70° and 85°, F. and fruit from these storage temperatures was analyzed from time to time throughout the season.

In the investigations as to the changes in composition of the fruit at different times in the season and the best time for picking the fruit, five pickings were made at monthly intervals, beginning the latter part of July and ending the latter part of November. The fruit was picked by Mr. W. J. Krome of Homestead from "Common Florida' 'trees.

TABLE I

Acid and Sugar changes in "Common Florida" Grapefruit on the tree.

	Date of Picking				
	7-29	8-27	9-29	10-30	11-29
Acid as % Citric	1.35	1.18	1.04	1.02	1.15
Reducing Sugar as Dextrose	1.52	1.84	2.45	2.96	3.70
Sucrose as Dextrose	1.53	2.53	2.63	3.34	3.25

Analyses of the various constituents of the fruit were made when shipments of fruit arrived in Washington. The results of these analyses throughout the season are shown in Table 1, which gives the decrease in percentage of acid as the season advances and the increase in sugar content. Both the cane sugar and reducing sugar increase as calculated to the wet weight of the fruit throughout the season. These facts, which are, of course, well known through the work of Collison, are brought out here to emphasize the oft repeated statement that to obtain its highest food value and attractiveness grapefruit must remain on the tree until it reaches full maturity and the longer it remains on the tree up to a certain point the higher its food value.

TABLE II.

Acid and Sugar change in "Common Florida" Grapefruit at 32 degrees storage.

	Days in Storage			
	0	61	104	179
Acid as % Citric	1.07	.92	.93	.89
Reducing sugar as % Dextrose	2.44	2.63	2.76	2.89
Sucrose as % Dextrose	2.33	2.43	2.44	2.40

The data on sugar and acid changes, as shown in table 2, are of course, representative of a number of such series and show the sugar and acid changes in "Common Florida" grapefruit for 179 days storage at 32°. It is noticeable in the table that the acid in the fruit is decreased markedly in the six months storage period. The sugar content remains about the same, however, there being apparently a slight rise in the sugar content, due undoubtedly for the most part to shrinkage of the fruit. This lowering of the acidity without a lowering of the sugar content results in a grapefruit much sweeter to the taste than the fruit which has not been in cold storage, a fact that is considered to be an advantage among many consumers. Another point which is of considerable interest in connection with the chemical composition of the fruit after storage is the fact that the bitter principle is apparently broken down during storage, the grapefruit being much less bitter after a period in storage. This, of course, also enhances the sweetness of the fruit, especially when taken in conjunction with the lowering of the acidity. The fruits, as a rule, after a period of one to three months in storage, are considered by good judges of citrus fruits to be superior in eating quality to the same fruits before they are placed in storage.

It would seem from the work that the physiological changes which take place in grapefruit during storage are very similar to the changes which go on in pears and apples after they are removed from the tree. It also shows that there is a possibility of maturing the fruit after it is removed from the tree and making it a much more attractive product than when fresh

picked, especially the fruit harvested in the early part of the season. As in the case of the pear or apple, you can not increase to any extent the food value of the fruit after it is removed from the tree, as fruits are mainly storage organs dependent for the most part for their supply of carbohydrates or stored food upon the foliage of the trees upon which they are borne.

In the work on grapefruit storage the most serious difficulty encountered was the tendency of the grapefruit to pit in cold storage; that is, after a certain period sunken spots would develop in the skin. These spots were small at first but gradually became larger until they sometimes reached a half inch in diameter. They became brown and presented an unsightly appearance. The fruit after the skin is removed has no bad flavor, as the spots apparently do not go farther than just through the peel. The appearance of the fruit badly affected with this pitting, however, would make it practically unmarketable in a normal market where it was in competition with the smooth, yellow fruit the treenfw cmfwy mfwy fwyp hrdlu recently removed from the tree. The pitting is evident after about four to five weeks at 40° storage temperature and after about six weeks at 32°. It did not occur at the higher storage temperatures, such as 55°, 70° and 85°.

Experiments were accordingly begun to see if there was some kind of storage whereby the fruit might be kept without pitting. It was noticed in the storage experiments already mentioned that the fruit did not develop these pits at common storage temperatures nor in warm storage, and

TABLE III

Pitting in Grapefruit three months in storage.

	Cured 3 weeks at 70° F. then stored at 32°		Placed in 32° storage without curing.	
	Good Fruit Per Cent	Badly Pitted Fruit Per Cent	Good Fruit Per Cent	Badly Pitted Fruit Per Cent
Duncan	100.0	0.0	6.0	74.0
Silver Cluster	88.2	0.0	50.0	50.0
"Common Florida"	100.0	0.0	20.0	65.0
Marsh Seedless	40.0	40.0	3.6	89.0

it was considered possible that the two types of storage might be combined; that is, a short storage period at high temperatures might render the fruit immune to this trouble. Tests were made by storing the fruit at about 70° for varying intervals from one to six weeks and then removing it to 32° storage for a longer period. In this work Duncan, Marsh Seedless and Silver Cluster fruit from Lake Alfred were used as well as "Common Florida" fruit from Homestead. The results of these experiments are shown in Table 3.

The indications were then that this pitting could be controlled to a considerable extent by curing the fruit at a temperature of about 70° with a fair humidity for about three weeks before it is placed in cold storage.

There is need of further experimentation on the problem, however, on commercial scale, curing the fruit here in Florida so as to eliminate all fruits which break down from stem end rot and then storing in the north where the fruit will be consumed. In all grapefruit stored there was, of course, a certain percentage which broke down in the curing and in storage, from stem end rot and from penicillium. The percentage of rot ran as high as 30 per cent in one lot and as low as 0.7 per cent in another lot for the entire operation, including curing three weeks, two months cold storage and an exposure of seven days after removal from cold storage.

In conclusion, it would seem that the physiological behavior of grapefruit in cold storage is very similar to that of apples and pears in regard to the two main constituents, in that the acidity decreases while the sugar content remains very much the same. As in the case of the apple and pear, the dessert quality of the grapefruit is usually very much improved by a period in cold storage. The fruit stores better when picked about midseason. That picked the latter part of the grapefruit season seems to be more apt to break down in storage. In these experiments 32° storage gave the best results though the fruit usually held up fairly well at the other two cold storage temperatures.

It seems probable that by curing the fruit in a warm room for from two to three weeks before placing in cold storage pitting, which up to now has been one of the most serious difficulties in the cold storing of this fruit, will be controlled. Further experiments on a commercial scale, however, are necessary before definite conclusion can be drawn on this point.

I would like here to express my appreciation to the grapegruit growers of Florida and especially to W. J. Krome and F. S. Poole for assistance. Without their hearty cooperation it would have been impossible to have carried on the investigation.

NEW MANAGER FOR NEW YORK OFFICE

The Florida Citrus Exchange announces the appointment of Mr. Errol M. Zorn as manager of its New York office, effective immediately.

Mr. Zorn replaces Mr. R. H. Holland for years manager of the New York office of this organization, whose recent death caused much grief in fruit and produce circles, where Mr. Holland was widely known and much beloved.

Mr. Zorn is well known to the trade, having had many years experience in the business in New York, and following in the footsteps of his father who preceded him in the business.

Mr. Zorn, who was born in New Orleans, came to New York some years ago when his father moved there to engage in busine.ss His experience has covered the handling of citrus and deciduous fruits from both Florida and California over a period of years, both in connection with three large distributing agencies and in connection with his own business.

Mr. Zorn at the outbreak of the war volunteered as a private in the 1st New York Calvary, from which he shortly was transfered to the 106th Machine Gun Batallion, 27th Division He saw service in Belgium and Flanders and has to his credit seven battles and engagements, including the breaking of the Hindenburg line and the taking of Mount Kemmel. He was discharged as Sergeant-Major of the machine gun batallion.

Mr. Zorn is a gentleman of prepossessing personality and much energy, which together with his wide experience in the fruit and produce business fits him particularly well for the position for which he has been selected.

Mr. Thomas C. Casey, for a number of years in the New York office of the Florida Citrus Exchange, has been promoted to the position of assistant manager of the New York office. The plans worked out by the executive officers of the Florida Citrus Exchange for this office contemplate covering a larger field of endeavor and extending its selling territory. It is aimed through the New York office to supplement the efforts of all Exchange representatives in New York State to the end that active contact shall be maintained with each possible carload market in the State. Mr. Zorn will be on duty in New York giving closest attention to the New York auction market, with the handling of fruit in which he is most thoroughly familiar.

The Surinam Cherry.

By Thos. W. Hewlett.

Recently we read a story of a man in Florida who managed to have fresh fruit from his own trees 365 days in the year. This fruit came from seventeen kinds of trees in his yard and no two of them bore different varieties of one fruit. Such stories are often read, but even so there are thousands of people in Florida who could have their own fruit ripening every day in the year, who only have it about one-third of the time and then only from one or two varieties. We have repeatedly heard people, natives and visitors, complain that it was impossible to get a plentiful supply of fresh fruit in Florida in the summer time. To one who is intimate with the many delightful sorts of tropic and semi-tropic fruits that have their ripening periods during the summer in Florida, such a criticism sustains cause for wonder as to whether some of the folks in this State are not a little slow to grasp the opportunities which lie at their very doorsteps. Enough trees will bear fruit from the end of the citrus season in spring to the beginning of the next season in fall to give everyone in Florida all the fruit for every purpose they could wish, besides leaving a big surplus at which to develop a countrywide market.

Settlers are coming into Florida every day and in a very few years the resident population of this State will have assumed such proportions that everyone who can manage to deliver fresh fruit to local markets the year 'round will find himself making a very profitable income from this source.

Aside from the commercial standpoint there are other reasons why the growing of a number of secondary fruits, that are now being more or less neglected in Florida, should be encouraged. The esthetic effect of a number of well developed fruit trees around a place is well worth striving for. A town or a community, containing a number and variety of trees bearing fruit in all seasons, is bound to attract favorable attention amongst visitors. Fruit is well known to be the best aid to good health we have. Children especially need plenty of fresh fruit at all times.

How many people are there in Florida who never heard of the Surinam cherry? Too many hands to count, and yet there are a good many of these cherry bushes scattered over the State.

The Surinam cherry goes by the name of Eugenia uniflora in the botanical world and has been described as being a large shrub, bearing rather small, bright waxy red fruits, of agreeable sub-acid flavor. It is a native of Brazil where it is known as Pitanga. It was evidently introduced into Florida from Dutch Guiana and hence the name Surinam cherry. In Cuba it is known as cerezo de cayena or cayenne cherry.

The plant belongs to the myrtaceae or myrtle family. Sometimes it grows as a small tree but more commonly is a large shrub. It branches near the ground, forming a compact bush from six to twelve feet high.

When the leaves are crushed they have a pungent odor and it is said that in Brazil they are gathered and scattered over floors in houses. The odor which is given off when they are trampled under foot is liked by the natives and is supposed by them to be efficacious in driving away flies.

The blossoms are white, about a half inch in diameter and are not very fragrant.

The fruit is sub-globose, about three-quarters of an inch in diameter and is prominently eight ribbed lengthwise. The seed is about three eighths of an inch in diameter and each fruit contains one seed and sometimes two. The flesh is soft and melting and very juicy, of the same color as the skin which is fairly easily separated from the fruit. To get down to plain English this cherry when ripe looks very much like a minature old fashioned tomato, in the days when it was ribbed and was known as the love-apple. Some people suggest that it has a turpentiney taste and not everyone likes the fruit at first trial. In this respect he Surinam cherry is like certain other tropical fruit—they taste so different to what one is accustomed, that it is necessary to get used to the aromatic flavor before a taste for it is acquired. To the writer's mind the fruit is delicious, but then we have been eating it every summer for at least twelve years, and we are not alone in this conviction because we have heard dozens of other people express themselves in the same manner.

In Florida the Surinam cherry will grow and bear fruit as far north as Gainesville, but like other tropical plants and trees the frosts we have occasionally may cut them back to the ground. However, they soon recover and spring up with multiple stalks and are bearing fruit again.

The bushes are reasonably drought resistant. Well drained land, with plenty of fertilizer in most any form, are two things necessary for success in growing this fruit. Vegetation turned under for humus, and manure are best during the first few years of the life of the bush. After they begin bearing, chemical fertilizers may be used with profit. There do not seem to be any disease or insects of economic importance that bother the bushes in this State. They do not grow quite as rapidly as some other fruit trees and it takes several years from the time the seed is planted before fruit may be expected. If properly cared for and well fertilized, after the bushes commence to bear, they will make two crops a year, one in the spring and one later in the summer. The writer has picked as many as twelve quarts of ripe fruit from one bush at a picking, and this may continue every day for a period of at least six weeks.

If a quantity of bushes are to be set out it will be advisable to plant them in hedgerows, planting the bushes from six to ten feet apart and the rows fifteen feet apart.

Propagation is all done from seed and here is an opportunity for someone to accomplish something worth while, which is to discover some other practical method of propagating the Surinam cherry, because they do not always develop true to kind and this is the cause of considerable variation in the fruit and of a number of non-bearing trees being raised. The seeds germinate readily, in fact we have seen literally thousands of young plants growing under the parent bush from fruit which had dropped. The trees are easily moved while young and should be placed, soon after first leaves have developed, into pots or permanent locations.

There are three distinct varieties of the Surinam cherry to be found in Florida. These are the red, the white and the black cherries, the only difference being in color. The red cherry is common, the white variety is found now and again and the black one is very uncommon.

As far as the keeping quality of the fruit is concerned it is about on a par with the strawberry and of course is best suited for local consumption or

for making jellies and preserves. The fruit will make a beautiful jelly with a delightful flavor and has all the natural requisites for so doing. They can be made into jam or preserved whole in syrup. Ice or sherbet made from Surinam cherries are frozen delicacies having a distinctive and very pleasing taste. Surniam cherry pie is the last word in good things to eat.

The Surniam cherry will be found useful as a hedge plant. It makes an attractive ornamental if not wanted for the fruit. We cannot urge too strongly upon fruit growers in Florida to include a few of these cherry trees in their orchard or grove. They should prove not only a source of much pleasure but of profit as well.

In preparing this article the writer is indebted to Mr. Wilson Poponoe for certain historical and botanical data, taken from his book "Tropical and Sub-Tropical Fruits." Also to Prof. P. H. Rolfs, late of the State Agricultural Experiment Station and at present in Brazil, for a very excellent letter upon the subject. Prof. Rolfs states that he has had little opportunity to observe the Surinam cherry in Brazil but heartily agrees with the writer in his contention that more tropical and sub-tropical fruits should be developed in Florida and that the Surinam cherry is not the least of these. To quote Prof Rolfs: "Many people whom I have known in Florida spent more energy complaining about the lack of fruit during the summer and fall than it would have taken to produce an abundance for themselves and their neighbors. In a number of lectures that I delivered in various parts of Florida I gave a succession of fruits that would enable one to have two different kinds every day in the year from his own half acre."

THE ORANGE FOR HEALTH IS FAVORED BY SCIENTISTS

It has been proved again and again that orange juice protects the child fed on cow's milk against scurvy, writes Dr. A. Sorane in "Herald of Health." Even a decoction of orange peels has been found quite as effective as fresh orange juice. Orange juice may also be given to the breast-fed baby, and has also a favorable influence upon the baby's growth.

For adults, orange diet from three to seven days will improve the blood. Along with green vegetables, oranges promote proper nutrition. Oranges contain those vitamines that protect the body from disease, warding off skin trouble, neuritis, improving the blood.—American Fruit Grower.

Fruit Exchange Mutualizes.

The signing of contracts between a number of New York Apple Growers Associations and the North American Fruit Exchange whereby several thousand carloads of New York apples will be marketed through one central organization under a standard brand not only opens the field to the New York apple growers as producers of a standardized and merchandised product, but incidentally assures to the North American Fruit Exchange the enviable position as the largest distributors in the world on a co-operative basis of apples and other fresh fruit and vegetables.

Recently at a dinner given to New York State farm leaders and notable farm representatives from all over the country, an announcement of unusual importance was made in the statement that the North American Fruit Exchange had been completely re-organized under a co-operative plan advised by Aaron Sapiro, the famous authority on farm marketing, and that in future more than one hundred farmers co-operative marketing associations, shipping nearly fifty thousand carloads of fruits and vegetables annually would share in the success of the operations of the Exchange.

The announcement is of importance to fruit growers all along the Atlantic Coast first because of the large quantity of fruits and vegetables handled by the North American Fruit Exchange from New York, New Jersey and elsewhere and, second because it presages an entirely new deal for the fruit growers of this country in the distribution of fresh produce to the great consuming markets.

It is well known that too much of the fruit and vegetables grown in nearby districts has been dumped on the market regardless of the condition of the market at the time of shipment. The result has been ruinous prices to the growers due to gluts at point of consumption. No sane system of ascertaining either supply or demand has been in effect. The New York farmer and farmers from other nearby states have been shipping in competition with farmers from practically every other state in the Union without any knowledge at all of the quantities being shipped by each other. The result has been a state of anarchy in the fruit and vegetable business for a long time past.

Under the plan of reorganization of the North American Fruit Exchange one hundred and forty branch offices have already been opened in the big distributing centers of the country. These offices will keep the general manager in New York in daily touch with market conditions and in turn the Exchange will notify each one of its hundred co-operating associations of the conditions of that particular market and instruct it to ship or divert to other markets as conditions may warrant.

But it is the development of the Exchange as a mutual organization which is the most important part of the new program. Arthur Rule, general manager of the Exchange, in a recent interview said—"We recognize the strength and force of the co-operative movement. We believe in it from the farmers and the consumers viewpoint. We know that it is the only way in which standardization of the farmers product which the consumer and the trade now demands can be brought about. We believe that co-operation for marketing will be the salvation of the farmer in the future as it has always been in the past when the farmers have been properly organized. And believing in the movement we have adopted a co-operative plan between ourselves and the hundred farmers organizations we ourselves represent, under which we will operate as a mutual co-operative organization."

Well known experts have been secured by the Exchange to handle the business of distribution. George A. Cullen, formerly vice-president of the Lackawanna Railroad becomes vice-president of the Exchange; C. E. Bassett, formerly chief of the U. S. Bureau of Markets, becomes director of field organization and J. F. Deegan, general sales manager.

The Exchange also maintains a department under the supervision of specialists to take up railroad claims and other details incident to the complex business of distributing a carload of highly perishable produce.

Represented in the Exchange are apple growers associations covering the Pacific Northwest, New York, Virginia and other states. Vegetable growers from Texas, Minnesota, Colorado, Michigan, New York, New Jersey, etc. Sweet potatoes from the Carolinas, Texas and Georgia; watermelons from Georgia and Texas; grapes from Michigan; berries, currants, grapes, peas, peaches from numerous other states, citrus fruits from Florida, etc.

The Growing of Satsumas in Alabama

By O. E. F. Winberg, Silverhill, Ala.

The best that I can do, I believe, is to give a brief resume of what we have done in Alabama since Satsuma orange growing was first established in that State. As far as our record goes, the first Satsuma orange in Alabama was planted in 1897, and I find that three trees survived the low temperature in 1899. Since that time there was very little planting, up to 1909. In 1909 there were only one hundred acres planted to the Satsuma orange in Alabama. In 1910 the Satsuma orange plantings started on a commercial scale and continued to grow so that after the planting season of 1916 there were over 16,000 acres in Satsuma oranges in Alabama. Then came the severe storm that swept over the Gulf Coast territory in July, 1916, followed by the freeze in 1917, and reduced the Satsuma orange plantings in the State by 3,500 acres. It was a very severe set back. However, in discussing the Satsuma orange culture in Alabama, I wish to call attention to several factors that contributed to these reverses.

There is always danger when any new horticultural project starts anywhere, that they will be over-esthusiastic. Then people get so over-enthusiastic that they fail to calculate the cost; fail to take into consideration the factors which underlie such important development. When it is only a question of the planting of truck crops, it is different, but when it is a question of planting something that will last for many, many years, then I believe it should be considered a pure and simple business proposition, and the cost be taken into consideration. In this case, by reason of the over-enthusiasm, these things were not considered. The mistakes committed were these: First, the 3,500 acres that suffered as a result of the storm and freeze of '16-'17 was due principally to their improper location. Orange trees should not have been planted where they were planted; conditions were not right; location was not right. Second, they had gotten into their heads that they could plant an orange tree in the ground, leave it and go back North. It didn't work. The orange tree requires attention. Third, they had not taken into consideration the cost, and when they were advised that in order to make this a paying proposition, they had to put in so much money, they got discouraged. Their trees were neglected. When we told them they needed to pay out money in order to make their investment good, they would not do it. They got afflicted with the disease we call "cold feet," a very serious one. And in 1916 when the canker situation in our State was extremely bad, I learned that there was a would-be scientist who advocated that they should plant Bermuda grass in the grove and let it grow. That would harden the trees to such an extent that the canker would have no effect whatever. That was better than the State's constant preaching about spraying and pruning, cultivation and fertilization, because the Bermuda grass proposition was only an initial small expense and after that nothing but rest. So one party planted 250 acres into Bermuda and went home and set down.

At the annual meeting of our Horticultural Society in 1918, he came and told us that it didn't work. All his tree had frozen down. Now the things that were responsible for the set back in 1916 and 1917 were principally the factors that I have mentioned, but probably most of all, insufficient care; in other words, simple neglect. Wherever we had an orange grove that had been given reasonable care the trees did not suffer. They suffered from defoliation, it is true, but they grew during the summer and gave a good crop the following year. On the other hand, where the trees had not received sufficient nourishment and sufficient cultivation the trees died in large numbers.

Now, I maintain that to establish an industry of this kind, the reverses that I have referred to are necessary. I maintain that it was about the best thing that could have happened in our State that th freezes and storm came, because if they had not come the enthusiasm would have continued to grow and would never have stopped. But this gave them a chance to stop and think and consider some of those things which some of us foolish people are constantly preaching, the care of the orchard. They found that it was actually a good thing.

Since 1915 I have been preaching over and over again on every occasion, the necessity for spraying, the necessity for cultivation, the necessity for fertilization, and the spraying, probably, has been the hardest of all of which to convince the people. The fertilization and cultivation is a combined proposition of which they can see the result, but when it comes to the elimination of insects, they cannot see its importance and it is hard.

Not until the fall of 1919 when the growers lost at the rate of approximately $100 an acre as the result of the damage caused by the purple scale, did they realize the necessity of spraying, and therefore these adverse conditions are often a lesson. Now to come back to conditions as they have developed, one factor that has done much to eliminate unnecessary and undue speculation was no doubt the citrus canker, because we had a quarantine notice up in the orchards where the disease was found. When these speculators came they didn't like it, because they had been told that there was no such thing as a disease attacking a Satsuma, and when they found out that the grove actually had such evils as that they got discouraged. Now, don't understand that this was averse to development, indeed not. But I believe above all things that we should go after things in a conservative way. Let us not hide anything, but when we tell the people to come down from the North to settle and induce them to invest their capital, tell them the facts. Then I believe we can eliminate 90 per cent of the disease called "cold feet."

Notwithstanding the adverse conditions, we have now in Alabama 14,000 acres in Satsuma, 12,000 acres of which are in bearing this year and two thousand acres of new plantings. We have during this year established a market for Satsumas. When we started our organization there in 1914-15 we sent one of our men up north to find a market for our fruit. He came back very discouraged. He had been in some of the principal marketing centers, but found none that would give him much consideration, but we have given that up and we have now, I believe, solved the question of marketing. We have standardized our fruit. We have, in cooperation with the U. S. Department of Agriculture, segregated our fruit into respective varieties of Satsumas. The packing question is partly solved. Packing houses are being established in various parts of the State (that is in what we call the Satsuma belt of the State) and we will need these packing centers. This fall we will have seven modern packing houses in operation. The crop is small yet, the trees are young. In fact we have just now reached the point where the trees

have recuperated so that they are in the same condition and size and otherwise as they were prior to the freeze of 1917, as they were very severely cut back, after freezing.

If these things had not happened, we would have shipped a good many carloads, but as it is, our maximum output last year did not exceed 150 carloads. But we believe that the Satsuma industry in Alabama is on a firm footing. We have eliminated the undersirable factors; we have established co-operation; we have tried to standardize our methods of cultivation, fertilization, spraying, etc.

With such modifications as may be necessary in different localities there is one thing that I believe is absolutely necessary in pioneering horticulture and that is co-operation. Had we not been able to effect a measure of co-operation among the people engaged in the industry, we would have had very few Satsuma orange trees left today and the industry would not have amounted to anything.

When we started in Alabama we knew nothing about citrus culture, and I want to take this opportunity to express, on behalf of the growers, our appreciation to the citrus growers of Florida for their co-operation. There has been no time when I have called upon the Florida people for assistance, when they have not given it and that has been a great help. I believe that our pioneering days are mostly over. We have reached firm ground and if no natural calamities come along, I believe that the Satsuma industry on the Gulf Coast, particularly in South Alabama, will be an important factor in fruit growing on the Gulf Coast, and I hope that it will extend into this State and in Mississippi. These three states, I think, are best adapted to Satsuma orange culture.

To outline anything in particular of what we are doing there, I will not take your time in doing. I will say, however, in reference to our cultivation methods, that it has been a considerable task to get the growers to cultivate. If they had started intensive cultivation in the spring and then stopped cultivation in July, of course, it would have been the best policy. But I found it necessary to advocate extending cultivation into August and as far up as September first, in the young orchards, for the reason that it was nearly impossible to get the people to do intensive cultivation in the young orchards in the first part of the season. And, consequently, where they did not do intensive cultivation at that time, their trees did not get the benefit of the fertilizer they put on in their orchards; the weeds got ahead of the trees and the trees went into a dormant state in the fall in a very weakened condition. That was the principal reason why so many trees died as a result of the freeze in 1917. On the other hand, where we continued cultivation over a longer period of time, the trees went into a dormant state in a vigorous condition, and they survived. Therefore, we are advocating, in Alabama, the cultivation in particular of the young trees up to September first.

We plant legumes in the young orchards planted this year and even orchards three years old, and cultivate on each side of the trees, and we find that a better method to develop a tree quicker and hardier than by the other method. When it comes to the bearing trees we, of course, cannot pursue that method. We tried to follow the same method in bearing orchards, cultivating up to the first or fifteenth of September, but that prolongs the ripening of the fruit, and when this fruit should be ripe it was then green and we were then approaching a new danger, that of being caught by the frost in the fall.

There are some problems that we have solved, and there are a good many problems to be solved. There is one thing that we are particularly interested in and proud of and that is the co-operation that we have received from the U. S. Department of Agriculture. That applies particularly to the segregating of the varieties and the establishing of tree records. These things, I believe, are of the greatest importance and I hope that in two more years there will not be an orchard of any consequence in the citrus area of Alabama where we do not have records, that together with the segregation of varieties will bring us another step forward.

GULF FRUIT AND PACKING CO. GETS SERVICES OF GOOD MAN

The Gulf Fruit and Packing Co., of Bartow, has been fortunate in securing the services of E. L. Sessions, well-known fruit and truck grower in Polk county, as well as in Moorehaven. Mr. Sessions is laying plans now and will be ready to begin operations along lines that he has charge of at once. His successful experience in buying, packing and shipping fruit and vegetables makes him a man of inestimable value in this kind of work.

GREAT ACTIVITY AT MAMMOTH GROVES

A recent visit to Manager Kramer of Mammoth Groves near Lake Wales, convinced the field man of The Citrus Industry that this great project is all that its name implies. With a total of 4,600 acres, about 1,500 of which is already planted, this is indeed one of the notable developments of the Ridge section.

Approximately 90,000 trees have already been planted, and as only first-class stock was used and the young trees have been given the best care and attention, the broad acres of the development present a most pleasing and thrifty appearance.

Three varieties of citrus fruits have been specialized in by the owners of this grove—Duncan grapefruit, Valencia and Pineapple oranges. A perfect system of tabulation and records is in vogue, which gives a complete record of every tree in the vast plantings. Given the location of any particular tree, the office superintendent can turn to his records and find a complete history of the tree; the date of planting, size at time of planting, variety of fruit, together with a record of its care since planting and any item of "personal history" which may attach to that particular tree.

The government has established a branch of the weather bureau at this grove, where daily observations are taken. A government experiment station also has been inaugurated which is in charge of Mr. Frank Holland as official experimentor. Here will be kept a supply of government lists of new plant introductions for distribution among growers. From this list growers may make selections of plants which are particularly adapted to the soil and climatic conditions of South Florida.

Work recently has begun on the construction of ten miles of hard clay roads, connecting the properties of Mammoth Groves with Star Lake and Templetown.

Manager Kramer, who has spent much time in the North during the summer, is convinced that the flow of tourist and homeseeker traffic to Florida this winter will be unusually heavy. He reports much interest in Florida citrus lands and groves among the prospective winter visitors and looks for much real estate activity of the better sort during the coming winter months. He says that the people of the North are just beginning to realize what Florida really offers in the way of citrus possibilities.

Some Real Facts on Citrus Culture in Florida.

By Alvin Fox.

The first season after clearing the land it should be planted in some annual crop such as velvet beans, cow peas or some other legume. This gives the small tree roots not removed in clearing time to rot, loosens and aerates the soil and adds humus to it. All vegetable matter, after the plants die, should be run over and cut to pieces with a disc harrow and turned under in November or December with a turn plow. An application of about a ton of ground limestone per acre after plowing on hammock soil will prove a great benefit. Before trees are planted it is well to thoroughly pulverize the soil with a culti-packer.

Citrus trees are propagated almost wholly by budding, the ordinary shield method being used, except that the cross cut on the stock is usually made at the lower end of the vertical one and the bud pushed up into place. It is best for the beginner to purchase his trees from a reliable nursery, but should he care to propagate them for himself, seed may be obtained for stock in late fall and planted out at once, in southern parts of Florida. It is well to plant these close together in rows in a seed bed; give careful fertilization, cultivation and watering as needed, and allow them to grow until winter. In December or January they should be removed to nursery rows, setting them from six to ten inches apart in rows three feet apart.

They should be set in good garden soil and fertilized and cultivated about the same as a garden crop. In the late fall the largest of these may be budded, others may be budded as soon as the bark will slip well in spring or in June or July. Buds should be selected from vigorous trees that are bearing good crops of fruit of high quality. It is important that the performance record as well as the name of the variety of fruit should be taken into consideration, as some trees even of the best bearing varieties because of individual characteristics do not bear well under the most favorable conditions.

The preferable time to set trees is in December and January. In place of those that fail to live, new ones may be set during the rainy season. A desirable arrangement is in rectangles 20x25 feet for oranges, 25x30 for grapefruit. Only budded trees of known varieties should be planted. If land is high pine, in south-central or southern parts of the state, they should be on rough lemon stock, if on hammock land in these sections and on all lands in central part, on sour orange stock, because of its adaptability to the moist soils and its greater hardiness. In the northern part, satsuma, the hardiest edible variety on trifoliata stock should be largely used, as the trifoliata imparts some of its hardiness to the scion and there is secured the most cold-resistant citrus plant bearing desirable fruit.

Trees whose roots are 3 or 4 years old, and whose buds are about 2 years old should be used; The tops of these should be cut back to 20 or 24 inches in length. When trees are ordered from a nursery, instructions may be given to have the cutting done before they are shipped, thus getting the benefit of the nurserymen's experience and skill, and reducing transportation charges on shipment of trees. Trees may be received at a time when it is not convenient to plant them out at once, in which case the bundles should be opened, all wrapping removed and trees heeled in. This is done by digging a trench 12 inches deep in a shaded place, preferably on the north side at an angle of 45 degrees and laying the trees side by side with their roots in the trench, their stems extending out over the sloped sides. The earth should be filled in about the roots, water added when trench is about half filled with earth, then filling completed. They will remain in this position for some weeks without injury. When taking trees to the field care should be exercised to protect roots from the drying influence of sun and the wind by covering them with burlap or convas till set in the soil.

In setting trees a hole should be dug deep and wide enough to receive the tree without crowding. In digging the surface soil should be put to itself, when the tree has been placed in the hole, the surface soil should be filled in about the roots in the bottom of the hole, one man holding the tree at the same level as it stood in the nursery with one hand shoveling in the earth slowly with the other, a second man carefully straightening out the roots with his hands, and placing the earth well under and around them. When hole is a little over half filled it should be packed well and if earth is not moist, at least half a bucket of water poured in, then filled to the top and packed again. It is well to mound up the earth about the tree, 8 to 10 inches to prevent evaporation. After growth begins in spring the mound should be removed and a saucer-like cavity shaped around the trees and watering done during spring droughts should they occur.

The number of varieties to select from is large. It is well to plant three or four that mature at different times so that the ripening season may last as long as possible. A good early orange is the Parson Brown, one of the best mid-season is the Pineapple variety and a good late one is the Valencia. Tardiff and Hart's Late being other names for it. An early grapefruit is a Triumph, though it is not of as good quality as the later varieties; good mid-season ones are Duncan and Marsh Seedless, and a good late one is the Walters. One should make a small planting at least of Tangerines and a few trees for variety of Kumquats.

About the time growth starts in spring one to one and a half pounds of special fertilizer for citrus fruits should be scattered in a circle about two and a half feet in diameter about each tree and worked in lightly with a rake. Another application of same amount should be made in June. The second year the quantity should be increased to two and a half pounds at each application, the next to five pounds, after trees begin bearing three applications per year should be made. The first in February, should be not less than three and a half of special fertilizer for citrus fruits; the second in June not less than three and a half pounds of same fertilizer, and the third about October, same amount of fertilizer compound for citrus fruits, as trees increase in size and bearing, the fertilizer should be increased one pound at each applica

tion for each box of fruit borne exceeding two.

All vegetable growth should be cut up and worked in the soil each year in December or January with a disc or cutaway harrow. This should be followed in one or two weeks with a turn plow, running to a depth or 4 or 5 inches. A catipacker should follow this in ten days or two weeks and soon after each rain till the beginning of the rainy season, about July, when a cover crop either of the native grasses or some legume should be grown. These cover crops should be kept up year after year till the trees reach bearing size at least. Soon after bearing begins, if ground is well supplied with vegetable matter the clean cultivation of the spring may be followed by the crop of native weeds and grasses which spring up during the rainy season. This may be cut with a hay mower before picking season begins, and either gathered as hay or allowed to rot on the ground to be disced and plowed under in winter.

Trees well fertilized, carefully cultivated and pruned are not so susceptible to injury from insect and diseases as those not given proper care—some of these they will attack however, and the grower must be ever watchful for their appearance, and when found get to work promptly with the proper remedies for their extermination. The white fly is present in all parts of Florida, except a few small isolated districts, and is with sooty mold which grows on the honey dew excreted by it—the worst pest with which we have to deal. The rust mite is also a serious one, applying the miscible oil sprays, such as those made from a parafine oil, fish oil and soap and water, in spring and fall for the white fly and scale insects, and at least one spraying with a sulphur solution for rust and other mites and red spider in June, will increase the size and quality of the fruit greatly. The parasitic fungi which grow on and kill the white fly may be spread by spraying on the spores during the rainy season. These aid materially in keeping the pest in subjugation. There is a little of the diseases Withertip and Melanose in most groves, and under certain conditions dieback and foot rot, stem end rot and some others may occur. These may be indirectly beneficial to the grower who is fully alive to the dangers about him and guards against them because they force him to give closer attention to his grove, and there follows that care which success requires.

A location on the south or east side of a lake is freer from frost as the wind blowing over the water in winter carries with it some of the heat the water has stored. Where water protection cannot be had a windbrake on the north and west sides of a grove of low branching native trees 40 feet or more wide is of considerable advantage. The modern oil-burning heater of three and one half to five gallons capacity placed 30 to 60 to the acre can raise the temperature to a marked extent.

The surest preventative for decay is a sound unbroken skin on the fruit so that Blue Mold Spores and other germs of decay cannot enter, carefully preventing or avoiding everything that tends to scratch or bruise it. Every step from tree to car is of more importance than the average grower is disposed to think. Modern clippers, picking bags, washers, driers, polishers and sizers have reached a high state of perfection, but the man behind all these must be careful, skillful and watchful.

The man who puts into the market clean, bright fruit, carefully graded and packed, will no matter how great the production get a paying price for his fruit. The careless grower who does not give close attention to details will fail in growing citrus fruits, as in any other line of business.

PROTECTING AMERICAN CROP PLANTS FROM ALIEN ENEMIES

The Federal Government expends several million dollars annually in efforts to combat serious insects and plant diseases that have been brought here from foreign countries. Several thousand insects have been listed in foreign countries which are known to injure crops and which have not yet been brought to our shores. Many foreign-plant diseases are also known to occur, and it is of the utmost importance to prevent their reaching us. The Federal Horticultural Board, an independent branch of the Department of Agriculture, is endeavoring to keep as many of these alien enemies out of the country as practicable. Special quarantines have been issued and rigid attention is being given to the inspection of plants reaching us so as to avoid the introduction of the pests.

The Bureau of Plant Industry is desirous of encouraging in every way the production of promising new crops in this country, and its Office of Foreign Seed and Plant Introduction is co-operating with horticulturists and plant growers in aiding them in introducing new varieties of plants in such fashion that they will not bring in any diseases or insects. It is often necessary to introduce plants in very small numbers and to grow them for a considerable time either in greenhouses or under very special conditions out of doors to make sure that all pests have been removed. When it is certain that the plants are freed of insects or diseases they may then be propagated more extensively and distributed to collaborators. In this way new crops are introduced without danger to the country.

In the Plant Quarantine work, which the Federal Horticultural Board is conducting, the Florida State Plant Board is participating actively and efficiently. At the principal ports of Florida, inspectors are stationed whose duty it is to prevent the introduction of plant pests and prohibited plants and plant products. This service has on numerous occasions prevented entry of pests which would have undoubtedly occasioned enormous losses and damage to our horticultural and agricultural interests had they been introduced. The states of California and Florida have perhaps the most highly developed plant quarantine services. This is but to be expected considering the vast horticultural interests of these states. The port inspection work is conducted along much the same lines in both. The California service was inaugurated some twenty-five years ago. Florida's is of more recent date. The value and efficiency of the work of these two states is evidenced by the fact that officials from other states and from foreign countries have made special trips for the purpose of observing and learning the methods practiced.

IS WORTH MANY TIMES ITS PRICE

Gotha, Fla., Sept. 25.

Dear Editor:

I congratulate you most heartily on your excellent paper—a paper dignified and first-class in every respect. Dr. J. Petersen's article on "The Papaya" is alone worth many times the subscription price. I hope that you may see your way clear to print many such articles, besides those on citrus.

Yours truly,

H. NELING.

Cause of Wastage in Export of Citrus Fruits

Synopsis of Report of South African Investigations.

In view of the growing disposition on the part of American citrus growers to seek an outlet into foreign markets and the increasing disposition of growers both in California and Florida to make use of water transportation in conveying their fruit to American markets, the following synopsis of a report made by South African government officials on the cause of wastage in the export of citrus fruits, is both timely and interesting.

South African shippers to overseas markets are meeting with many of the same problems which confront the California shippers who are placing their products on the Eastern markets by the water route, and doubtless many of the same problems which will confront Florida shippers should they decide to invade the European field.

The South African report in question was made by I. B. Pole Evans, head of the division of botany, Miss Mary R. H. Thompson, mycologist in the Transvaal and V. A. Putterill, government mycologist in the Cape Province.

The fruit was actually picked, graded and packed by inspectors of the division of botany and plant pathology and was then shipped to London in the usual way. The experimental packs were given a distinctive mark and were consigned to the trade commissioner at London. They were treated as any other shipment would be except that they were inspected at Cape Town just prior to boat shipment for the purpose of detailed examination and report. "Wasty" fruit was removed, says the report, and the balance of the shipment was sent on its way.

On its arrival at London the fruit was carefully inspected and reports were made on its condition. These reports form a part of the bulletin on the subject.

Eight experimental consignments were made during the period from May to September and totaled 188 cases. As a check or control 18 experimental cases picked, graded and packed under the same conditions were forwarded to the botanical laboratories at Pretoria where they were kept under observation by Miss Thomson. As stated in the bulletin, the purpose was to show what could be accomplished when ordinary care and precautions were taken in handling the fruit.

The examinations included the mycological examination of the atmosphere outside the citrus zone, in the citrus orchards, in the packing house and in the fruit trucks, followed by an examination of the wood used in packing, examination of the various packs, the cultivation of the various organisms found and inoculation experiments with these. Further examination was made in the government cold stores on the quay, in the ship's cold stores and passageways, besides the examination of the fruit packs while in transit. Examinations were made of the cool chambers and ventilated holds of the ship, and the methods of handling in unloading and reloading on the train.

The conclusions reached in a nut shell were "that with ordinary care and intelligent handling it is possible to place South African citrus fruits on the over-seas markets showing a negligible amount of waste."

The precautions necessary to attain this, says the report are:

I. In the Orchards:

(a) The fruit must be kept free of scale and other insects which puncture the fruit.

(b) All fallen fruits must be collected regularly and destroyed.

(c) The fruit must be picked with the greatest care, so that no injury is done to it in handling, either by clippers, fingers nails, or bruising, when it is being transferred to the collecting boxes, which should be well ventilated.

(d) In transit from orchard to packing shed, well-sprung wagons must be used, the boxes must not be filled too full, and they must be so arranged that there is no possibility of one box injuring the contents of another when jolting occurs.

(e) The greatest care must be exercised in off-loading the fruit.

II. In the Packing Sheds:

(a) The packing shed must be kept scrupulously clean. All discarded and mouldy fruit must be destroyed.

(b) The packing shed should be thoroughly cleansed and disinfected before packing begins and after packing ceases.

(c) The packing shed should not be used as a general store when no packing is going on.

(d) The fruit should be allowed to cure for at least three days.

(e) It should be handled as little as possible.

(f) An intelligent person should be employed to feed the grader and should be responsible for discarding all wasty and blemished fruits before the fruits are graded. The grading machine should be so constructed as to cause no injury to the fruit.

(g) In wrapping the fruit every form of injury which might be caused by allowing it to drop, or puncturing it with finger nails, should be guarded against.

(h) The fruit boxes must be made of smooth, well seasoned clean and strong wood. Sufficient space for good ventilation must be left between the boards.

(i) The fruit must be so packed that no abrasion to the skin can possibly occur as the result of too tight packing. A heavy bulge must be avoided.

(j) Great care must be taken to prevent damage to the packs in transit to the rail and in loading the fruit truck.

III. In the Fruit Truck:

(a) The truck should be clean and well ventilated.

(b) The packs should be so stacked as to allow free circulation of air amongst them.

IV. On the Quay:

Careful handling in off-loading and transporting to the boat is essential.

V. In the Cold Stores:

The chambers must be clean, dry and well ventilated.

"Having insured the arrival of non-wasty fruit on the overseas markets, it only remains for growers to improve the appearance of their packs in order to command the world's markets.

"This can only be attained by paying greater attention to the general attractiveness of the packs, both as regards external and internal appearance, while more careful grading of the fruit with regard to quality and appearance must be carried out.

"From observations made both in the laboratory and on packs on arrival in England regarding the keeping

qualities of the fruit, it is obvious that much has yet to be learned regarding the most suitable temperatures at which the fruit should be carried."

Dr. Pole in concluding his introductory statement acknowledges the assistance of Managers Allan and R. B. Smith of the Rustenburg Orange Export Co. and the Rustenburg Citrus Growers, Ltd., in providing the investigators with fruit at a cost price at a time when it was very difficult to obtain material.

Miss Thomson in her opening statement says that the wastage detected thus far in South African fruit is brought about mainly by the green olive mold—Penicillium digitatus, which fungus obtains entrance to the fruit only through a bruise or injury to the skin. She concludes by asserting that with greater care in handling more careful disinfection in orchards and packing sheds that there is no reason why further loss should be incurred in fruit exported. She also declares that more care should be exercised in correctly stacking packs in shipholds.

A large number of experiments were used in making these investigations. The bulletin is liberally illustrated and many temperature charts are included.

The following extract summarizes the whole thing and really puts the responsibility back on the grower and packer:

"The outstanding fact of all the observations made is that the success of the industry depends more on the individual care and foresight of the grower in handling and packing his fruit than on such less easily remedied and more obscure factors as the numbers of fruit-rotting organisms in orchard, packing-house, cool chamber and on boxwood. Given moderatly satisfactory climatic conditions, the amount of decay in oranges shipped to markets overseas is dependent on the care with which the fruit is handled.

"If all growers would realise that it pays to pack only the best fruit, that it pays to pack it attractively, that sound fruit is easily injured, and that injured fruit is an easy prey to attack by fruit-rotting fungi, immediately good would be the result. A keen, healthy spirit of rivalry between the growers of a district, and at the same time a spirit of mutual help and cooperation amongst them, whereby those of experience would place their knowledge at the disposal of those less experienced, would do much to bring about this realisation."

Citrus Diseases and Remedies.

Of all the diseases of citrus trees—and there are many—a number will be of more trouble during the next few months than others. These are: Foot rot, scab, withertip, dieback and stem-end rot. An attempt is made here by the Florida Agriculture Extension Division to give as briefly as possible necessary first-hand information concerning these diseases.

FOOT ROT— This is a bark disease and attacks the tree at the crown, or on the main roots just below the surface of the ground. The first indication is a small area of decayed bark from which there is a slight oozing of gum. The decayed bark first appears water soaked. It is caused by a fungus which lives in the soil and is found usually in low, moist, shaded soils. At first indication of the disease remove the soil from about the infected roots. Cut away the diseased parts of the bark. Apply some disinfectant and paint with a wash of air-slaked lime and powdered sulphur.

SCAB—This is a disease of the leaves, young twigs and fruit. It is caused by a fungus, and is evident on the parts mentioned as circular, elevated, scabby masses and wart-like projections. Control method is by bordeaux spray, which should be commenced just before blossoming time and continued as needed with a 3-3-50 solution.

WITHERTIP—This disease is also caused by a fungus and attacks the twigs and branches of weakened trees. The affected parts wither and die, and many leaves fall. It causes a distinct type of injury to fruits known as anthracnose. Sanitation in the grove and keeping up the vitality of the trees are best remedies. Cut out all infected branches. When anthracnose appears on the fruit spray with an ammoniacal solution of copper carbonate.

DIEBACK—This is a disease about which little is known. Five main characteristic symptoms usually distinguish it from other citrus diseases, namely: Gum pocket, stained terminal branches, ammoniated fruits, bark excrescences and multiple buds. Treatment is both preventive and curative. In most cases a cessation of intensive cultivation, proper drainage and limiting the amount of ammonia in the fertilizer are beneficial. Bluestone in small amounts worked into the ground is sometimes curative. Bardeaux spray, 3-3-50 solution, is also used as a curative.

STEM-END ROT—This disease is caused by a fungus which is found chiefly in the dead wood in citrus trees. Scale insects also favor the development of the disease. Removing the dead wood and keeping down the scale is a proper method of treatment. Spraying with a solution of oils or soaps is best for control of scale.

NAILS FALSE RUMORS REGARDING CITRUS CROP

H. G. Gumprecht, Manager Manatee County Citrus Sub-Exchange, Issues Statement Concerning Crop Prospects

(Bradentonw Herald)

Rumors of the bumper crop is a false alarm and not justified, says Manager H. G. Gumprecht, of the Manatee County Citrus Sub-Exchange. He further states that such artificial propaganda in scaring the grower to sell for a song will defeat its own purpose, for it is old bait, is stale and has lost its magneto. But thanks to the organized efforts of our big cooperative marketing organization, the search-light has been turned on and will continue to shine, uncovering the bare facts.

Considering the recent dry weather, which does not aid fruit to increase in size, it is more reasonable to expect that the total will not much exceed 13 million boxes and there will likely be a slight increase in grapefruit and a small decrease in oranges over last season's crop.

The real problem now is the shipment of green and immature fruit. It will behoove every grower to use the utmost care and not rush out a large volume of unpalatable fruit, which is sure to cause a decided reaction in the market and a great financial loss to the entire citrus industry, and this applies to all growers, regardless of affiliation. Remember that regardless of acid test, the consuming public is the final judge, and they know when fruit is ripe, and you can't fool them.

There are a few favored spots where with great care a reasonable amount of grapefruit can be moved without damaging the market. Some of our section is so favored. But if some of the reports materialize which promise 300 to 400 cars within ten days, then let me sound a warning that in 30 days hence there will not be a market in the United States where grapefruit can be sold at a reasonable profit.

Large Output of Gypsum Products.

From the U. S. Geological Survey, Department of the Interior

In 1920, for the first time in the history of the industry, the quantity of gypsum mined in the United States in any one year exceeded 3,000,000 tons. The total quantity mined was 3,129,142 short tons, as compared with 2,420,163 tons in 1919, and the total value of crude and calcined gypsum sold was $24,533,065, an increase of nearly $9,000,000 over sales in 1919. The figures indicate that the industry had a prosperous year. All the principal gypsum producing states increased their production, and the quantity of gypsum sold for each of the common uses was larger than in the preceding year. The demand for agricultural gypsum was so great that the sales rose from about 40,000 tons in 1919 to 107,443 tons in 1920. The other notable increase was in the sale of gypsum boards and blocks. The quantity of this material sold was 308,756 tons, valued at $6,091,617, as compared with about 180,000 tons, valued at about $2,300,000 in 1919.

Gypsum produced and sold in the United States in 1920:

	Quantity (Short tons)	Value
Sold without calcining—		
For Portland cement	541,901	$1,941,057
As agricultural gypsum	107,443	557,925
For other purposes	19,916	66,213
	669,260	$2,565,195
Sold calcined—		
As wall plaster, Keene's cement, Plaster of Paris, etc.	1,578,360	$15,723,372
For dental plaster	1,731	27,440
For glass factories	15,637	125,441
As boards, blocks and tile	308,756	6,091,617
	1,904,484	$21,967,870

Gypsum was mined in 18 states and in Alaska. More than half the gypsum sold in 1920 was mined in four of these states—New York, Michigan, Ohio and Virginia, the only producing states east of the Mississippi.

Gypsum sold in the United States in 1920 by states:

State	Total quantity mined (short tons)	Total value of products
Iowa	571,895	$ 4,422,965
Kansas	130,044	968,298
Michigan	382,212	3,521,028
Nevada	143,929	1,100,251
New York	780,296	6,438,929
Ohio	277,899	2,161,038
Oklahoma	136,279	816,768
Texas	220,157	1,439,491
Wyoming	57,732	410,724
Other States	429,700	3,253,563
	3,129,142	$24,533,065

The imports of gypsum increased in 1920, but are not yet so large as before the war. The imports of crude and calcined gypsum in 1920 amounted to 297,407 short tons, as compared with 451,925 tons in 1913.

TO TRY CAVE STORAGE FOR HIS GRAPEFRUIT

(Sarasota Times)

Joe B. Briggs, of Lake Wales, has made arrangements with H. Guy Nickerson, of the Bay Shore Development Company at Tampa, to store 5,000 boxes of grapefruit in Mr. Briggs' cave in Kentucky, not far from the Mammoth Cave, as an experiment.

It is said that the cave maintains a year-round temperature of 48 degrees, and is as dry as can be.

"BLUE GOOSE" APPLES WIN AT WESTERN FAIR

Blue Goose apples won the Washington State Fair sweepstakes at Yakima last month in the most warmly contested exhibit ever held by northwestern apple shippers.

The American Fruit Growers Incorporated in addition to winning the big sweepstake prize for the best twenty-five box exhibit also won twelve other prizes.

The twenty-five box exhibit which won the sweepstakes was composed of five boxes each of Delicious, Grimes, Golden, Spitzenbergs, Jonathans and Winesaps, all produced on the Yakima district orchards of the American Fruit Growers.

There was more competition among shippers for exhibit prizes than at any fair ever held, both Wenachee and Yakima sending heavy quotas of exhibitors.

In addition to the sweepstakes the A. F. G. won first prize on the best five boxes of Grimes Golden, first prize on the best five boxes of Jonathans, first prize on the best single box of Winesaps, first prize on the best single box of Spitzenbergs, second prize on the best single box of Grimes Golden, second prize on the best box of White Winter, first prize on the best plate of Grimes Golden, first prize on the best plate of Winesaps, first prize on the best plate of Winter Bartletts, the gold medal peach prize, second prize on the best plate of Anjou pears and third prize on the best plate of Spitzenbergs.

FORT LAUDERDALE HOUSE SOON READY TO PACK

The Fort Lauderdale Citrus Growers' Association has acquired the Hector warehouse in Fort Lauderdale which is particularly suited for packing house purposes. The building is fast being equipped with a full outfit of citrus packing machinery, purchased from the former Standard Growers' Exchange packing house in Miami.

This association is looking forward to shipping between 20,000 and 30,000 boxes during the coming season, and with very excellent prospects for future enlargement as the young groves in this territory mature.

The Fort Lauderdale Association formerly had its fruit packed in the Cocoanut Grove house of the Exchange, but now feels sufficiently advanced to be justified in operating its own packing house.

SOME FUNDAMENTALS OF GROVE PEST CONTROL

(Continued from Page 11)

white fly. The rains of summer may also have less effect in washing off the spray made of an oil with a high viscosity than it does on one with a low viscosity.

Sulphur Sprays

Since more than half of the spraying is done with some form of sulphur, it is certainly advisable, on the part of the grower, to study the fundamentals of this question. At the present time, there are several dry forms which are substitutes for lime sulphur solution on the market. The manufacturers of each claiming their product as superior. As to which form is the most serviceable and cheapest perhaps is not definitely settled. Some few points are sufficiently well established that the grower should take them into consideration. The sulphur in these various froms is the active ingredient. In applying them to the tree they should be used so that they will each have the same amount of sulphur in the diluted material. In other words, evaluated on the sulphur content basis.

When these sulphur sprays are purchased, they should be paid for solely upon their sulphur content basis. The claims of convenience should not be taken into consideration even in the slightest degree.

In regard to the machinery and other appliances necessary to carry on spraying, perhaps, it is well to mention that only one or two matters should interest all citrus growers. In spraying for white flies and scale insects, the main object to be attained is the wetting of all the surface of the tree. This includes the leaves, limbs and the trunk. Thoroughness is the watchword for success. It really does little or no good to kill 40 or 50 per cent of the scale insects and white flies on a tree and it should be remembered that it costs just as much to kill 50 per cent as it does 90 or 98 per cent. So far as appliances are concerned, at the present time thoroughness can only be obtained by the use of an extension rod fitted with one or more angle nozzles of the "Cyclone" type. This appliance will produce a wide field of spray every place it is put or every place it reaches. Thoroughness cannot be accomplished with the so-called spray gun. This appliance is beyond all question the greatest enemy that the spraying business has ever received in the state of Florida. It sacrifices thoroughness, it teaches the use of slovenliness and under-mines the most fundamental principles in attaining satisfactory results for the control of these pests. The so-called spray gun in the few years since its advent in Florida has practically ruined the citrus spray business so far as controlling the white flies and scale insects are concerned. It may have a place in spraying for rust mites, where speed may be justified, but it certainly has no place where thoroughness is the most fundamental factor in the attainment of success. It is lack of thoroughness that causes about 50 per cent of the spraying operations carried on at the present time in Florida to be absolutely void of results.

NEW GENERAL MANAGER STANDARD EXCHANGE A GEORGIA EXCHANGE MAN

The new general manager of the Standard Growers' Exchange, now affiliated with the Florida Citrus Exchange, comes to the position from the Georgia Fruit Excnange, of which he has been manager since 1914, his resignation having been accepted by

the directors of the latter organization, to take effect Oct. 15. Under the management of B. T. Christman, it is said, the fame and sales of Georgia peaches have extended steadily with each succeeding year. During the season just closed 10,468 cars were handled through the Georgia Fruit Exchange, as against 4,095 cars in 1915.

Due to Mr. Christman's efforts, the plan of marketing the Georgia peach crop has been changed from the consignment basis to an f. o. b basis, as is evidenced by the fact that in 1921 75 per cent. of the fruit marketed was on an f. o. b. basis, as against 15 per cent in 1917.

The directors of the Georgia Fruit Exchange accepted with regret Mr. Christman's resignation, and his successor will be announced later. As vice-president and general manager of the Standard Growers' Exchange Mr. Christman will continue his work in the development and sale of fruits and vegetables throughout the Southeast. With headquarters in Orlando, the Standard Growers' Exchange also maintains offices in Atlanta, Macon, Miami, Tampa and Southern Pines, N. C.

Mr. Christman is said to be familiar with every detail incident to the new position, as he began as a stenographer for the Atchison, Topeka & Santa Fee railroad, and worked steadily upward, later becoming chief clerk to the superintendent, and after that joining Armour & Company, being identified with the Fruit Growers' Express, owned by that company, becoming general Southeastern agent in 1909, from which position he resigned in 1914, to take the management of the Georgia Fruit Exchange.

TO CONTROL PYRIFORM SCALE ON AVOCADOS

There is an enemy of avocados, guavas and a number of ornamental shrubs and vines, that, in its effects, resembles that of the whitefly upon the orange tree. This is the pyriform scale. Professor J. R. Watson, entomologist of the Florida Experiment Station, in discussing this scale before an audience of growers not long ago said:

"What the whitefly is to an orange tree, the pyriform scale is to an avocado. It gives off a honeydew in which grows a sooty mold more profusely than on an orange tree following whitefly. The scale is one of the largest of the soft scales, measuring from a twelfth to a sixth of an inch in length.

"As its name indicates, the mature female is pear-shaped, tapering to a point in front. The scale itself is brown, is surrounded by a wide fringe of white cottony-looking wax. This cotton serves as a protection to the eggs which are laid in it. The young are oval in shape, greenish-yellow in color and are without cotton. For an illustration of this scale, see Florida Experiment Station Bulletin 148.

"The scale is best killed by one of the oil-emulsions, commonly used for scale and whitefly on citrus. And should be used at the same strength as recommended for whitefly; that is, the solution should be 1 per cent oil and 99 per cent water."

Bud Selection in New Zealand.

By A. D. Shamel.

Official report of the fourteenth annual meeting and conference of the New Zealand Association of Nurseymen held at Wellington, Jan. 12 and 13, 1921, has come to the writer's attention. In this report the organization of a Bud Selection association is announced. In this connection the minister of agriculture, the Hon. W. Norsworthy, stated—

"I understand that the Nurserymen's Association has a movement afoot towards the formation of a Bud Selection Association, with a view to the improvement of the existing varieties of fruits and plants. It is earnestly hoped that your efforts in this direction will meet with success; and I am confident that the Department will render any assistance in its power to forward the movement."

Following this recommendation, a joint committee was appointed for the purpose of considering the organization of a Bud Selection association. This commitee was made up of representatives of the Nurserymen's association, the Fruit Growers' Federation, and the department of agriculture officials. The report of the joint committee was as follows:—"Having affirmed the desirability of the formation of the Dominion Bud Selection Association, they recommend that the new organization be called the New Zealand Nomenclature, Plant Breeding and Bud Selection Association, to be known officially as the New Zealand Nomenclature Board. The objects of the Association were stated to be: (1) To investigate all matters in relation to tree and plant nomenclature and to issue from time to time decisions on the same. (2) To investigate the merits and claims of new varieties of trees and plants, and to arrange for the compilation of data and the issue of information connected therewith. (3) To arrange for the breeding and selection of all classes of commercial trees and plants, with a a view to the production of a supply of bud and graft wood for distribution as scions to nurserymen for propagation purposes and to fruit growers for top-working. (4) To investigate existing distinct strains or new strains or types of standard varieties, such as, for instance, the Strumer Pippin apple, and, if deemed worthy after the necessary trials, to take the necessary steps to introduce such as distinct strains, or to replace those at present existing because of their being of a higher standard of merit. (5) To arrange for the propagation of bud wood and scions, from selected fruiting trees of standard varieties of outstanding merit. (6.) To furnish on terms to be arranged certificated bud wood and scions of the selected sorts to nurserymen and others for propagating and top-working as the case may be. (7) And in general to pursue any other object having in view the advancement of horticulture."

Those eligible for membership in this association include registered nurserymen, registered fruit growers or associations of fruit growers, officers of the department of agriculture, persons or representatives of firms or organizations engaged in the marketing, preserving, storage or export of fruit, and membrs of educational or scientific institutions, whether public or private, interested in horticultural research.

The plan of organization provides for a president, vice-president, a board of (say) ten members representing the classes interested in the associations, and a manager and secretary. It was suggested by the committee that the necessary finances be obtained by subscriptions from nursery firms, fruit growers and various associations, by grants and donations, and by sales of bud wood and scions, trade mark labels, etc. The committee also recommended that steps be taken at the right time to secure by legislative enactment full recognition of the association or board and that the association, when formed, and pending necessary legislation, be registered and incorporated under one of the existing acts. The report of the committee was accepted and the necessary steps taken to inaugurate this new organization.

This action by the New Zealand nurserymen and fruit growers is interesting because of its relation to similar activities in California, particularly the work of the California Fruit Growers Exchange, which furnishes to nurserymen and others bud wood secured from superior parent trees of the important commercial citrus varieties. This instance is one of several which have recently come to our attention, indicating a movement throughout the entire world looking toward the improvement of fruits and vegetatively propagated material from superior parent trees or plants. The work of this new organization in New Zealand will be watched with a great deal of interest by horticulturists in this country, and it seems likely that the experience of this organization may be of considerable interest and value to similar endeavors relating to the production and distribution of reliable and improved propagating and plant material in the United States.

SAVE BEGGARWEED HAY

The feeding value of beggarweed hay is often under-rated by even good farmers. This plant is a legume, a plant having the ability to take nitrogen from the air by means of germs which live in nodules on the roots, and it consequently contains more protein substances than ordinary grass hay.

Professor J. M. Scott, of the Florida Experiment Station, urges every farmer to utilize as much of this valuable legume as he possibly can. He says that the yield is ordinarily not as great as from Crab grass or Para grass, but when cut at the right time —when one-fourth of the field is in bloom—it makes a superior hay, a hay so palatable that stock will not let as much go to waste as of other hays.

Practically all hay crops make the best forage when cut in the middle of the blooming period. If cut before this time, there will be little hay left because of the high content of water evaporated. The older the plants get, the less water they contain. If overripe, the water content will be so low that the hay will be woody and unpalatable. For best results, cut the crop when about a fourth of it is in bloom.

Special attention should be given to the curing. Do not let the hay lie too long in the hot sun. It should be raked into windrows soon after being cut and left to cure. Do not stack permanently in the mow, nor haul to the barn, nor bale before it is well dried out, as it wil lturn black and have a smutty appearance if so treated.

ORANGE COUNTY FUMIGATION CO. OCCUPIES NEW OFFICES

The Orange County, California, Fumigation Co. has moved into its new office on South Grasselle street, Orange. The company erected the building for its use which adjoins its warehouse and the acid house. The plant is located at the junction of South Grasselle street and the Santiago Creek. The organization is now fully equipped to take care of its growers' needs.